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PULP AND PAPER MAGAZINE OF CANADA

VOL 6. TORONTO, JANUARY, 1908. NO. 1

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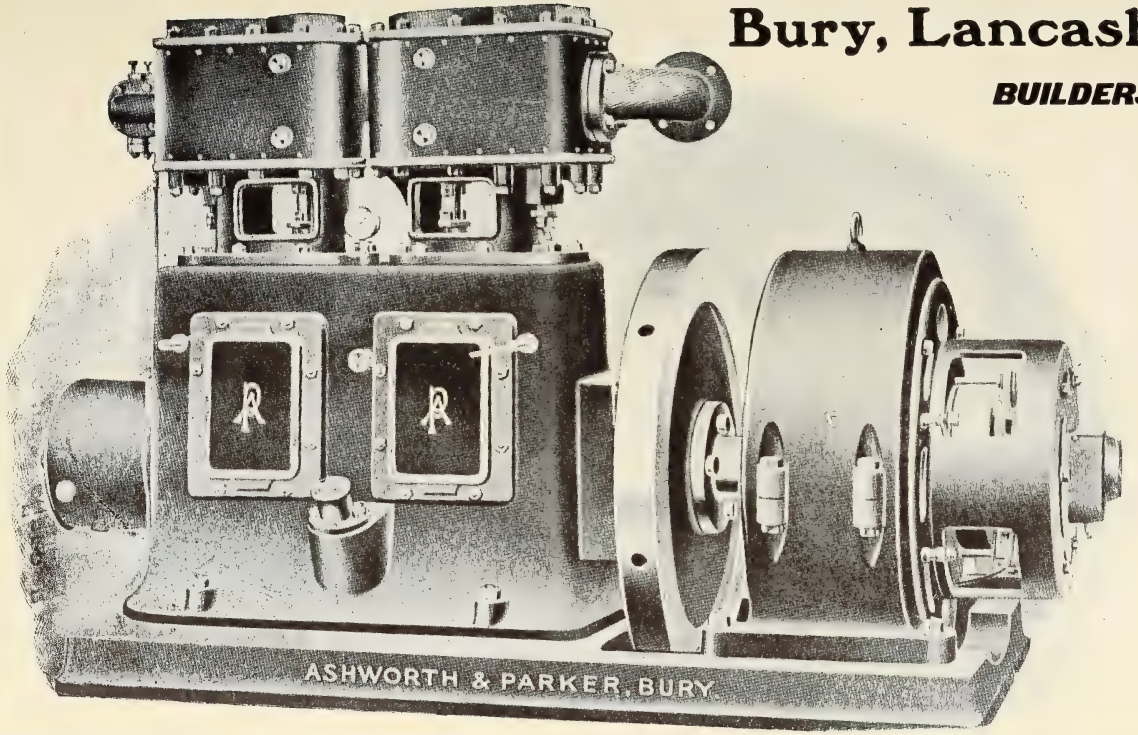

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CELLSTUFF AND PAPER CHEMISTS' ASSOCIATION.

The annual meeting of the Cellstuff and Paper Chemists' Association was held at Berlin, Germany, on the 9th and 10th ult. Papers were read as follows:— Herr Willi Schacht, of Weissenfels (president), on "Rosin Sizing with Hard Water." Herr Fritz Arledter, of Hamburg, on "Commercial Rosin Sizes." Herr Albert Ahlin, of Eds Bruk, on "Electric Cellstuff Bleaching." Dr. W. Vieweg, of Berlin-Zehlendorf, on "New Cellstuff Constants." Dr. Klemm, of Gautzsch, on "Sediment Testers for Pulp." Also papers by Herr R. Wieselgren, of Nygvarn, and by Dr. Hans Hofmann, of Berlin, who has just completed an extended tour through the paper making industry of the United States.

American interests were represented by A. D. Little, of Boston, Mass., who is scheduled for a paper.

PULP IN NORTHERN ONTARIO.

A representative of the "Financier and Bullionist," touring in Canada, writes to that journal from Haileybury, Ont., as follows:—

"Among the many and great industries of Northern Ontario, pulp-making holds no mean place, and it is destined, I should say, to a much higher place in the future, the reason for this being that the conditions of pulp and paper manufacture in Canada are pertect, viz.:—

(1) Unlimited water-power.

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(4) A hungry market in the United States always demanding more and more pulp.

"With such conditions it is surprising that British investment in this enterprise is not greater.

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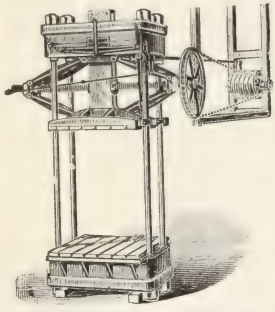

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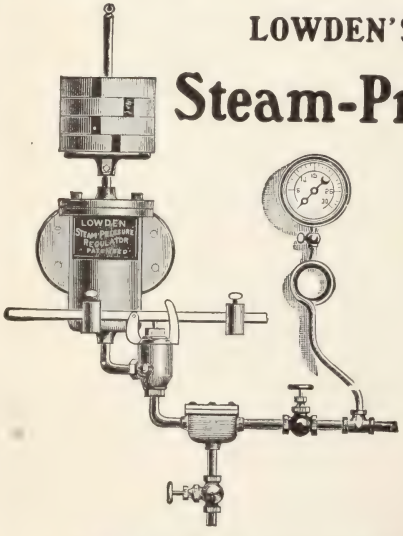

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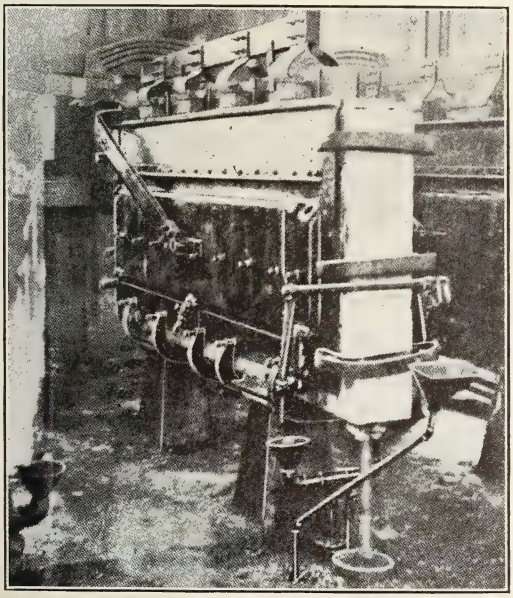

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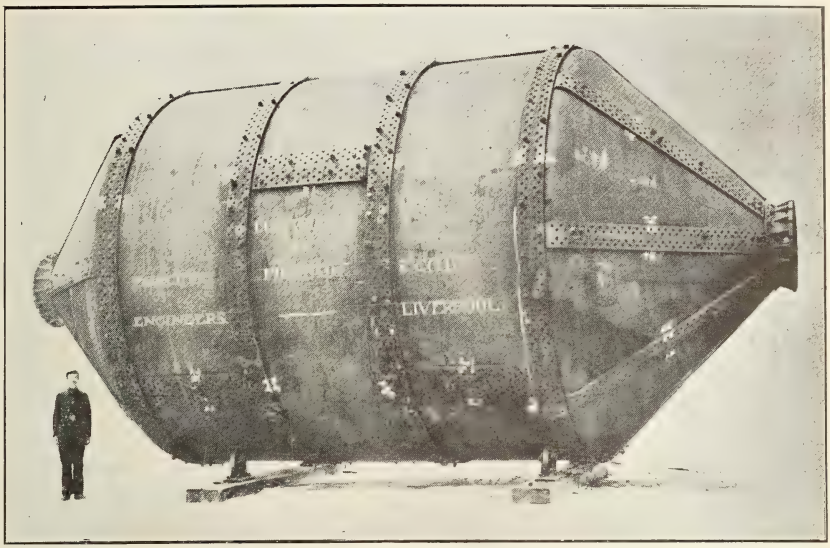

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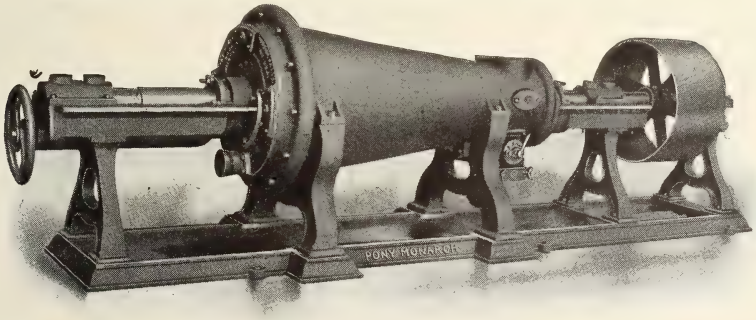

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THE
PULP AND PAPER MAGAZINE OF CANADA

Vol. 6.—No. 1. TORONTO, JANUARY, 1908. $1 A YEAR / SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade.

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month, and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

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ROYAL COMMISSION ON FORESTRY AND WATER-POWERS.

The suggestion made by a correspondent of the "Pulp and Paper Magazine" that the Canadian Parliament should appoint a Royal Commission to go into the whole question of a forestry policy, including the pulp and pulpwood question, has apparently been taken up at Ottawa. The daily papers report that the Government may appoint such a Commission, very probably during the present session. Such a Commission could take evidence and digest it into a series of recommendations, which could be acted on after the elections, no matter which party was returned to power.

It is most sincerely to be hoped that such a question, affecting every material interest of the country, will be kept out of party politics, and this can be done by giving the Opposition its full share in the work of the Commission; while the Commission will act wisely in giving the broadest scope to its enquiry.

As has been shown frequently in this magazine, the permanence and efficiency of the great water-powers of Canada—unique in the geography of the world—depend upon the regulation of our forests. That the people of this country are beginning to understand that the control of our chief water-powers concerns the whole community and is not the prescriptive right of a few favored manufacturers is evident from the recent votes on the water-power question in the chief cities of southern Ontario. Electricity now enters to such an extent into the daily life of the people that, seeing the scarcity of native coal in many parts of Canada, it is becoming more and more a necessity for the people to see that this vital source of power is within the control, if not in the ownership, of the communities that need it.

As the maintenance of these water-powers—essential alike to the industrial progress and the social comfort and well-being of our people, comes back to a question of forest regulation, it will

be admitted that the problem is not a mere pulpwood question or a matter of paper manufacturing, though the greater includes the less.

Let the Commissioners be the safest and most broad-minded men to be found in the country, men who have no fads nor personal interests to warp their judgment, and the material gathered by such a Commission will enable Parliament to frame a policy which will save Canada from the dangers that now beset the United States, where the wholesale destruction of forests has brought injury to its water-powers and navigable rivers, and ruin to much of its agricultural land.

THE SITUATION IN NEWS.

There is no doubt that a good deal of the responsibility for the present trouble, between publishers of newspapers and the manufacturers of paper rests upon the former for their unbusinesslike attitude in selling their productions below cost. In many cases two or three cents' worth of paper is sold for a cent. Who is to blame for this state of things? Surely not the manufacturer, who, after paying advanced wages, higher costs for raw material, and for everything entering into his business, sells his product at nothing more than a barely reasonable profit over the cost of production. He has had to advance the selling price of his article, simply because the cost of everything entering into its production has advanced. Why should a publisher alone be able to stand out against this universal law of the business world and say: "No; we have charged one cent per copy in the past, and we are going to charge one cent only in the future." He must, as, indeed, many publishers have already done, either advance his selling price or reduce the size of his periodical. Some fairly clear-headed people think that it would not hurt the world at large if some of those newspapers which now are making the loudest complaints would cease publication altogether. Certainly a material reduction in the number of their reading pages would not be any loss.

Hugh Chrisholm, formerly president of the International Paper Co., and now chairman of its board of directors, says: "The day of the one cent paper is past. Publishers are circulating advertisements instead of newspapers, many papers have as much advertising and as little real news in proportion as a theatre programme."

He defends the paper manufacturer in his treatment of the forests as follows:—

"The lumber mills may waste timber, but we do not. The lumberman has $1,000,000 worth of forest and a $50,000 sawmill; we have a $1,000,000 mill and a $100,000 forest. We utilize 25 per cent. more of a tree than the lumberman does."

Another part of the interview in which these remarks were made reads as follows:—

"I wish the publishers would see that this agitation against us will have a bad effect in Canada. We lease a great deal of land from the Canadian Government. The law there says that each May the Government shall fix the rate for the coming year. Is it not reasonable to suppose that the officials of the Canadian Government will be affected by this noise in the United States and will raise the rate? And

if the rate is raised, can we make paper more cheaply?"

Paper manufacturers who have a stake in their own country are likely to follow the dictates of commonsense, not only from motives of patriotism, but through considerations of their own interest. What may be done, however, by those who do not own a permanent stake in the future pulpwood production of Canada is another question.

PULPWOOD CONSUMPTION IN THE UNITED STATES.

The latest circular of the United States Forest Service shows that in 1906 the consumption of pulpwood by American mills was 3,661,176 cords, almost half a million cords in excess of the previous year. Of this, spruce accounted for 2,507,002 cords in 1906, compared with 2,273,254 in 1905. There was a heavy increase in consumption of hemlock, the figures being 528,381, against 375,422 cords. Nearly all of this was reduced by the sulphite process. More than half of the mechanical pulp production is in New York State, Wisconsin coming next. In both consumption of wood and manufacture of pulp New York has always ranked first. The consumption in that State in 1906, however, shows a small decrease from the previous year's figures, while Maine, Wisconsin, Pennsylvania, and New Hampshire all increased their consumption. In the mechanical process, domestic spruce comes first with 826,511 cords, the imported spruce amounting to 290,080 cords. Of the latter, 217,233 cords were used in New York.

For the sulphite process spruce furnished two-thirds and hemlock over one-fourth of the raw material. In 1906, the quantity of wood reduced by the soda process was 504,777 cords, about three-fifths of this being poplar.

The average price given per cord of wood in 1906 was $7.21, as compared with $5.56 in 1905, part of this difference, however, being due to the fact that in 1905 the value was given as at point of shipment, whereas in 1906 it was given as at the mill. The strong market for lumber of all kinds during the year helped to force up the price of pulpwood. The circular states, however, that most of the large tracts of pulpwood timber are rapidly passing into the control of large pulp producers, who in many instances are holding them in reserve for future supply and are purchasing for their present needs in the open market. This action withdraws from the present source of supply a considerable area.

All of the wood imported into the United States for the manufacture of pulp comes from Canada. The quantity increased from 369,217 cords in 1899 to 738,872 cords in 1906. Since 1905 the imports have increased nearly 15 per cent. The amount in 1906 was 721,322 cords of spruce and 17,550 cords of poplar. Imports of the latter fell off compared with the previous year.

For the year ended June 30, 1906, imports of wood pulp were 157,224 tons, worth $4,584,942, or over 10,000 tons less than in 1905. By far the largest part of this comes from Canada, and the fact that the amount has thus diminished shows, says the Bulletin, that it is more profitable for Canadian manufacturers to market their product elsewhere than in the United States.

THE BANKS AND THE PUBLIC.

The financial stringency has come and —almost gone, but the general feeling among the business community of Canada is that for this welcome state of things the banks cannot take much credit. The money tightness was precipitated in the first instance by the fact that Canadian banks held large loans in New York because, forsooth, these loans were more easily called in from that centre than they would be in Canadian cities. When the panic was at its height in New York our banks had to protect themselves and their shareholders, but they did it largely at the expense of the Canadian business men and manufacturers, whose interests they, as Government-chartered institutions, were supposed to represent. Money needed for moving the Western grain crops was not forthcoming. Large manufacturing and mercantile houses which had always looked to the banks for accommodation in the ordinary course of business, found themselves suddenly cut off, with the result that they had to curtail operations and still further increase the prevailing depression. The banks themselves had little or nothing to lose, for, although they reduced their loans, the higher rates of interest charged prevented any reduction in their earnings.

We talk a good deal about the safety and the superiority of our Canadian banking system, and no doubt there is warrant for this under certain aspects. But there is a very strong sentiment that the banks in protecting themselves should not tend to cast the business community into a panic. Many questions are being asked as to the position of the banks on real estate. Cases are recorded where, in their mad rush to obtain "strategic" points for their branch buildings, particularly in Western towns, they have precipitated an inflation of values which afterwards, in tones of high superiority to the general public, they have been the first to frown upon.

CANADA'S PULP RIVAL?

One notes from time to time in American papers which dislike the idea of the United States having to place reliance on Canada for its supply of pulp material, boastful allusions to what they can get from Norway and Sweden. They bring the suggestion of Scandinavian pulp not only with the idea of assuaging their ever-increasing fear of coming famine, but with a view to quenching any high-flown hopes of monopoly which may have loomed up in Canada on her own behalf. But the following cool-blooded assertion, reported to have been made recently by the London manager of Ohlson & Corineau, the Norwegian firm which supplies most of Europe's raw material for paper-making, should give a death-blow to any such expectations:—

"Scandinavian wood pulp manufacturers will never seriously attempt to enter the United States. The freight would eliminate most of the profit, even if the pulp were admitted duty free. Besides, the Scandinavian wood pulp supply is diminishing so rapidly that we have trouble to keep pace with the European demand, and have advanced prices 10 per cent. within two years."

And the latter, be it noted, in face of the strenuous efforts of the Government in the direction of reforestation, and conserving the pulpwood supplies.

NEWFOUNDLAND'S POSITION AS A PULP PRODUCER.

It is stated that the Amalgamated Press, Limited, of London—in other words, the Harmsworths—have decided to invest at once out of its reserve funds a quarter of a million pounds in paper mills on its concessions in Newfoundland. The total capital authorized for this purpose is about $4,000,000. It is interesting to note the president's statement that the yearly consumption of paper by that Company amounts to £700,000, and that a rise of ¼d. per pound on their present paper bill would represent £70,000 per year. The idea underlying their present immense investment in Newfoundland is to guard against the inevitable and disastrous shortage of paper they believe will soon ensue. The distance from Newfoundland to Liverpool is only 1,968 miles, and the transportation facilities are excellent. Wm. Little, of Montreal, the pioneer of forestry on this continent, speaking of the forest growth of that island, states that fir and spruce are found in vast quantities from 6 to 24 inches on the stump, growing thick in the ground, and generally tall and clean. The wood, he goes on to say, is unusually dense, and of a fibre particularly suitable for pulpwood. In these circumstances, it may be added, and particularly in view of the Island's prohibition of pulpwood exportation, Newfoundland is bound to become a highly important factor in the world's pulp and paper industry. In fact, some believe that the largest share of the requirements of the United States in the way of pulp will in the future have to come from that Island.

The formation of a Forestry Association in Newfoundland, coincident with the growing conviction of its own importance in the pulpwood and lumber field, is another noteworthy development of the present year. This Association has for its patron His Excellency the Governor of the Island, and for its president Sir Robert Bond, the Premier, besides whom several men prominent in the lumber industry are directors. The objects of the Association are to determine the areas suitable for agricultural settlement and those which should be permanently reserved for timber growth; to encourage afforestation and reforestization; to encourage judicious methods in dealing wih the Island's woodlands; and to look after its general timber interests in every possible way.

It is gratifying to learn that the Harmsworths are fully alive to the necessity for conserving pulpwood growth, and that they intend taking thorough measures for the reforestizing of their areas.

—That some at least of the English paper mills are making money is indicated by the report of the affairs of the Kellner-Partington Paper Pulp Co. This shows a gross profit for the year of £250,241, compared with £306,483 in the previous year, the reduction being solely due to the stoppage of the mills through a strike. Altogether, last year dividends of 20 per cent. were paid.

—According to an English authority French paper-makers prefer Canadian to Norwegian wood pulp on the ground that the Canadian pulp gives a better surface. For long years the French Custom House has insisted that the pulp boards should be perforated, to prevent them from being used as cardboard, upon which there is a higher duty. Makers of pulp in the Dominion have demurred against the perforation rule, as it increases the cost of production; hence the French market is partially closed to them.

PULP AND PAPER NEWS.

"La Voix du Peuple" is a new weekly Quebec city paper issued in the interests of labor.

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The Union Sulphur Co., incorporated under New Jersey laws, has been granted an Ontario license to do business in that Province.

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Last year the shipments of pulpwood from Levis, Que., by rail and steamer to the United States amounted to about 60,000 cords, valued at $354,000.

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The Canada Loose Leaf Company, Limited, Toronto, has been authorized to increase its capital stock from $20,000 to $49,000.

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The Imperial Paper Box Co. are negotiating with Niagara Falls city council for the erection of a factory in that city to employ fifty hands at the start.

* * *

Lockerby & McComb's factory in Montreal for the manufacture of tarred felt roofing was badly damaged by fire on the 6th inst. at a loss of over $40,000, mostly insured.

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The Miramichi Lumber and International Paper Co. will probably purchase D. & J. Ritchie's lumber property at Newcastle, N.B., for about a quarter of a million dollars.

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J. Barasalou et Cie, Limited, Montreal, capital stock $175,000, have been granted a charter to manufacture soaps, pasteboard, etc. H. and E. Barsalou, of Montreal, are interested.

* * *

The Elliott Paper Box Co., Toronto, making boxes for the candy trade, was last month burned out at a loss of $150,000. The machinery included coating, lithographing, printing and corrugating plants.

* * *

The Fort Alexander Lumber and Manufacturing Co. has been incorporated under Manitoba laws to manufacture pulpwood, buy and sell paper, etc. Wm. White, of Minneapolis, is a prominent member.

* * *

The Dominion Envelope Company will establish a factory on Spadina Avenue, Toronto, capable of turning out half a million envelopes per day, on the Samuel Cupples' patent. E. Newell is managing director.

* * *

A. & C. Boehmer, Limited, Berlin, Ont., have been incorporated with a capital of $40,000 for the manufacture of cardboard and paper boxes, etc. A. and C. S. Boehmer, of Berlin, Ont., are provisional directors.

* * *

The International Paper Co.'s output of wood on its Richards & Hutchinson properties on the Miramichi for the past year will amount to about 40,000,000 feet, most of which has been shipped from Chatham to the United States.

* * *

The tug "Beatrice M.", was seized by the shipping inspector at Port Arthur last month on a charge of carrying passengers without a license. The tug is owned by the John Bowman Fish Co., and under charter by the Northern Islands Pulp Wood Co.

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The Nepisiquit Lumber Co., Limited, Bathurst, N.B., capital $100,000, has been granted a charter authorizing it, among other things, to manufacture and deal in pulpwood. F. S. Morse, Springfield, Mass., and H. B. Curran, Bathurst, N.B., are members.

* * *

The machinery of the Wm. Hamilton Company, Peterboro', Ont., has been placed in the hands of the A. R. Williams Company, Toronto, for disposal, either in parcel or en bloc, R. R. Hall, M.P., who had purchased the plant, not having found it possible to reorganize the Company as he had hoped.

The Reg. N. Boxer Co., Limited, New Toronto, Ont., capital $250,000, have been granted a charter to manufacture and deal in wall paper, wood pulp paper of all kinds, glue, etc. Hugh Watson, Montreal, and R. Alex. Robertson, of Hamilton, are among the members of the company.

* * *

The B. Greening Wire Co., Limited, has been incorporated to take over as a going concern the business of the B. Greening Wire Co., Limited, in Hamilton, Ont., manufacture and deal in woods, metals, minerals and chemicals and their products; also tools, machinery, etc. Capital stock is placed at $750,000.

* * *

The International Paper Company has completed the purchase of 550 square miles of spruce lands from the Dalhousie Lumber Company, situate on the Restigouche River. It is said to be that Company's intention to treat these limits in the most scientific manner available with a view to rendering them perpetual.

* * *

The Consolidated Lithographing and Manufacturing Co., Limited, Montreal, capital $250,000, has a charter to carry on an engraving and lithography business, manufacture and deal in paper, cardboard, etc. G. H. Burland, of Ottawa; W. W. Burland, of Montreal and E. C. Landon, of Westmount, are members of the Company.

* * *

Ottawa city council passed a by-law in favor of purchasing for $175,000 a power franchise at Britannia, a distance of eight miles away, the idea being, if approved by the ratepayers, to build a dam across the river. The pulp and lumber men of Ottawa, however, object to anything being done which will increase the cost of moving their logs down the river. In the meantime, the owners of the power refuse to sell at less than $200,000.

* * *

Louis P. Bouvier, envelope maker, Toronto, was placed on trial a few days ago on a charge of conspiring with other envelope manufacturers to prevent Miss Maude McCann from obtaining employment at her trade as an envelope maker. Defence claimed that Miss McCann had stirred up trouble amongst other employees; and that she was discharged for unsatisfactory work; but that it had nothing to do with any agreement with other manufacturers. The case was traversed until the March sessions, the jury being unable to agree.

* * *

A writ has been issued by the Union Trust Company, Limited, against Geo. W. Fowler, M.P., and others, "to recover the sum of $55,000, alleged to have been received by the defendants for the use of the plaintiffs, and interest thereon, and for an account, or, in the alternative, for damages to the same amount for conspiracy to defraud." The suit arises out of the British Columbia timber and mills deal, which figured before the Royal Commission on Insurance. It is claimed that Mr. Fowler purchased certain timber lands in British Columbia, for which the price was $175,000, but that they were transferred to a syndicate financed by the Union Trust Company at the figures of $225,000, and the balance between that sum and the bona fide price of $175,000 is now sought to be recovered from Mr. Fowler.

* * * *

Owing to a difference of opinion between the United States Consul at Three Rivers, Que., and three Canadian paper mills as to the price of paper at the mill, twenty carloads of news paper were last month tied up at Detroit. The contention of the United States authorities was that the price of paper at the mills was $40 or more on the ton, while the paper men declared it has not gone higher than $38. The United States tariff provides that the duty on white paper, when the price is under two cents a pound, or $40 a ton, shall be three-tenths cents per pound, while if the price is between two and two and a half cents a pound the duty shall

be four tenth cents a pound. The customs authorities alleged, on the strength of reports from the consul at Three Rivers, that the twenty carloads tied up were appraised at a lower rate than two cents a pound, or $40 a ton, to escape the additional one-tenth cent duty. After hearing the evidence of the Canadian paper manufacturers that their material was not being sold at the mills for two cents, or more than two cents a pound, General Appraiser Howell intimated that his decision would uphold the Canadians, and decided that the cars held up should be released at once.

MINERAL SIZING.

Owing to the high price of rosin, German technologists are raising the question: how far can rosin sizing in the case of printing and wrapping papers be replaced by mineral substances precipitated in the pulp in a colloidal form? Dr. Klemin has pointed out that rosin is only a "size" toward aqueous inks, that it is soluble in, and, therefore, incapable of resisting oily media, such as printing inks. Consequently in such cases, the hardness of sized paper is really that which is imparted by the colloidal alumina preciptated as the result of the interaction of the rosin size and the alum. It is obvious that in order to obtain this alumina it is not necessary to employ rosin size; any alkaline substance will do as well, and, in fact, the mere presence of cellulose and hard water is sufficient to decompose relatively large quantities of sulphate of alumina. An experimenter, working on these lines, used at first silicate of soda and sulphate of alumina, expecting to obtain a mixed precipitate of gelatinous silica and colloidal alumina. Experience showed, however, that under the conditions prevailing in the beater, the silica of the silicate of soda was not precipitated, but ran away in the dissolved form with the backwaters, the sizing effect obtained being merely that due to the alumina. Silicate being an expensive substance, the writer turned his attention to a particularly cheap form of sulphate of alumina, recently advocated by Dr. Klein, using this alone without any alkaline precipitating agent. This form of the sulphate is a calcined crude aluminous cake, the water usually present in such products having been expelled by the calcination. According to the analysis of this cake, it contains 67 to 73 per cent. of anhydrous sulphate of alumina, 2 per cent. of alumina insoluble in water, 0.1 per cent. to 0.2 per cent. of iron, 0.5 to 2.0 per cent. of free acid, and 20 to 25 per cent. of silica; 60-65 parts of the calcined sulphate are equivalent to 100 parts of ordinary refined sulphate of alumina. Since the cake is sold on the basis of its water-soluble alumina contents, the silica is obtained free of cost, and if this is added to the beater along with the rest of the solution, it becomes hydrated there into such a gelatinous condition that it may be reckoned to contribute to the mineral sizing effect which is obtained. This calcined sulphate is not readily soluble in cold water, but requires to be boiled with water for half an hour; the solution is then diluted and added to the beater together with the suspended matter in the usual way. For printing and wrapping papers of any but the highest class, the small percentage of iron is unobjectionable, and this calcined cake is now being used with considerable success.

—The Dominion Government has passed new regulations for cutting timber on its lands in the West. Sales in future will be by public auction. Before any parcel of timber is offered for sale it shall be cruised by an employee of the Dominion Government, and an upset price placed upon it by the Minister. No berth shall be sold at less than this price. Purchases to the amount of $1,000 or under must be paid for in cash at the time of the sale. The purchaser must pay the cost of survey before a license is issued. The license shall be renewable from year to year.

NEWS OF THE MILLS.

The Don Valley Paper Mills have been granted a permit for the erection of a $10,000 factory on Radenhurst Street, Toronto.

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The E. B. Eddy Company, Hull, and J. R. Booth, Ottawa, have now signed the agreement regarding equitable division of the Chaudiere water power.

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The Hinton Electric Company, Vancouver, B.C., are installing a 500 light electric plant in the Canadian Sulphite Pulp Company's mill at Swanson Bay, B.C.

* * *

R. B. Horton, late manager of the Dominion Pulp Company's mill at Millbank, N.B., was recently married in England, but will shortly return to Canada and take the management of a pulp mill in British Columbia.

* * *

The Rouge River Hardwood and Development Co. has acquired a Quebec charter to hold timber limits, manufacture pulp and paper, etc. Chas. E. Read and F. W. Avery, of Ottawa, and F. J. Graham, of St. Jovite, Que., are members.

* * *

Carriere Bros. Co., Limited, St. Louis, Que., have been granted a charter to acquire timber lands, build pulp and paper mills, and manufacture articles composed of wood, paper or pulp. Capital, $150,000. L. A. & F. Carriere, of St. Louis, Que., are charter members.

* * * *

The paragraph in last number, taken from an exchange, to the effect that the Riordon Paper Mills, Limited, were appealing against a judgment to pay a certain sum for the death of J. E. Cameron was in error, that Company informing us that they know nothing of the man in question.

* * *

We regret to learn of the death of Jas. T. Shearer, which took place in Montreal on the 7th inst. after a short illness. He was president of Shearer, Brown & Wills Co., Limited, lumber merchants and manufacturers; also of the Jacques Cartier Pulp and Paper Co., besides having several other business interests. Mr. Shearer leaves a widow, one daughter and two sons.

* * *

The St. John Pulp and Paper Company sent a communication to the city council, informing it that the Mispec pulp mill would no longer be run on account of lack of profits. A committee was appointed to confer with the Company's representatives, and it was also decided to inform the company that Recorder Skinner had decided that the Company was liable for keeping the mill in repair.

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The British Canadian Wood Pulp and Paper Co., referred to in last number as about to build pulp mills in Howe Sound, B.C., has now received its charter authorizing a capital stock of $1,000,000 and giving power to acquire the patent rights of I. C. W. Stanley on machines for the purpose of disintegrating wood for the manufacture of pulp or paper; also his secret process for making pulp from sawdust. The fact that this company proposes to utilize the great waste material from the large sawmills of Vancouver and vicinity gives its plans particular interest.

* * *

Charles E. Orvis and John T. Terry, Jr., New York, representing the Canadian Improvement Company are petitioning for an injunction restraining the holders of the pledged stock of the Lake Superior Corporation from voting on that stock. The Canadian Improvement Company, it will be remembered, was organized to finance the Lake Superior Corporation, Sault Ste. Marie, Ont. It is asserted that an agreement with Messrs. Orvis & Terry gave the bankers and other holders of pledged stock the right to vote at the annual

meeting of the Lake Superior Corporation in October last. They were prevented from voting, however, by legal proceedings. The Fidelity Trust Company, of Philadelphia, is the largest holder, having $400,000 worth of the stock. Kuhn, Loeb & Company hold $225,000 worth of the stock. The issue is on the construction of an agreement for the extension of time on notes which matured last spring. The plaintiffs say that the right to vote on the pledged stock was not given.

WOOD DISTILLATION.

According to circular 114 of the United States Forest Service there are two distinct processes for obtaining valuable products from wood by distillation—destructive distillation and steam distillation. In the destructive process the wood fibre is broken down and new compounds are formed, but in the steam process this is not properly the case. In both processes the volatile compounds of the wood are vaporized.

In destructive distillation heat is applied below the wood-containing vessel, which has a comparatively small pipe as its only outlet. The heat vaporizes the volatile compounds, such as water and turpentine, and breaks down the non-volatile compounds, such as cellulose and the wood gums; it forms a number of new compounds, usually of a simpler chemical nature, and these in turn are vaporized with the water and turpentine, leaving a residue of charcoal. The decomposition of the wood in this process is exceedingly complicated, and is not yet fully understood.

In steam distillation, which is much simpler, the wood is chipped and placed in a closed receptacle into which steam is blown from a boiler, and the volatile compounds which are not chemically united with the rest are vaporized and carried out of the retort with the steam. Though in practice the wood is often so much overheated that the wood fibre is slightly decomposed, and though it is quite possible to carry the overheating so far that the process becomes one of destructive distillation, it is nevertheless true that "steam distillation," as the term is technically used, signifies the separation of volatile products from wood with, at most, but little decomposition of the wood fibre. With both these processes the vaporized compounds after leaving the retort pass through water cooled tubes, where they are condensed into the crude liquors which after refining yield marketable products.

Different woods give different marketable products after distillation. Thus the hardwoods—beech, birch and maple—yield acetate of lime, wood alcohol and charcoal, and long leaf pine yields turpentine, tar, pine oils and charcoal. This difference in the products is due to the fact that pine woods are resinous, while hardwoods are non-resinous. From the point of view of products, therefore, it is necessary to distinguish between the kinds of wood used, as well as between the distillation processes.

—Commissioner James S. Whipple, of New York State Forest, Fish and Game Commission, has given rise to considerable argument by making the statement that young evergreen trees ought not to be cut for Christmas trees, but that artificial trees should be used as a substitute. The average Christmas tree, he says, has a growth of about seven or eight years, and the tree reaches a point in growth in the next ten years that makes it very valuable. To destroy millions of these trees every year when we are in such need of more timber everywhere, and especially of the soft wood variety, seems very wasteful. In a few years, if the amount of timber cut continues as large as at present, and there is no evidence of diminution as long as there is any left to cut, the United States will not have any considerable timber for commercial purposes in the State except that on State land.

FORESTRY FROM A COMMERCIAL STANDPOINT.

The address delivered recently by F. W. Rane, State Forester for Massachusetts, before the Massachusetts Horticultural Society, contained so many points of interest to Canada, especially its older parts, in connection with the commercial as distinguished from the academic aspects of forestry that we present the following abstract of it:—

Doubtless there are those present who have known this forest patient when she was healthy, vigorous and strong; how beautiful primeval forests dotted this good old Bay State in those days and how year by year they have succumbed to our mad rush of economic commercialism until to-day finds us in a sadly depleted and unrational condition viewed from the standpoint of modern forest management. It is always easy to point out mistakes after they have happened, but experience, though a dear teacher, is nevertheless extremely effective. Year by year the primeval forest growth was cut and harvested; second growth, inferior but valuable, has followed where conditions have been favorable; this has in turn been utilized as soon as it reached merchantable size. Demands for forest products have been increasing in greater and greater proportion as we have been developing the State and nation, while the products themselves have likewise been approaching exhaustion. Our people have looked upon the forest products as inexhaustible, thinking naturally that though Massachusetts should be depleted there are plenty of other States at our very doors with indefinite supplies. Many of our country-loving and far-sighted citizens have time and again in the past predicted our present calamity.

When logs were taken to the mills most farmers employed their teams and labor during the winter months in getting out lumber for home consumption but sold enough to make the effort and time profitable. The old-fashioned method was also not to cut clean, but to take only the larger and mature trees. Our present method is to sell the stumpage and, as the purchaser finds he is able to market every vestige of the product, the forest area is stripped of vegetation. When only here and there a tract was cut the surrounding growth reseeded it, to-day the reseeding factor is also cut, leaving great areas where nature is unable to assist as formerly. The white pine for example will re-establish whenever the conditions are favorable, when as in earlier times the ill-shaped and limbed specimens contained no commercial value they were allowed to remain standing. These trees make our best seed trees, hence were responsible for reforesting the land with this species. To-day even these seed trees have value, now matter how pronged or crooked, they will make box-boards, pails, tubs, matches, etc., and bring prices of from $14 to $16 a thousand when delivered. The results of this practice are, as we find them, altogether too common. Portable mills are operating at the present on wood lots that in earlier times could not be used commercially. Where the diameters of trees were thought of in terms of feet, we have simply changed the feet to inches for present practical usage. The commercial pine tree of to-day hardly reaches the seed producing age before it is harvested.

What is true of white pine is equally true of many other of our forest trees. Our pulp companies chew up practically everything of the spruce and even balsam fir, which a few years ago was considered practically worthless, but which at present is of equal value in limited amounts. Hemlock was little thought of for joists and general framing material in buildings not long since, but our carpenters now are not so particular. The American larch, commonly called tamarack or hackmatack, found growing in low, moist situations, was valueless until railroad ties and telegraph poles

grew scarce, and then they found immediate value, now having largely disappeared. Hickory, commonly called walnut in New England, was the only wood thought suitable for tools, axe handles, whiffle-trees, etc., but go on the market and see what are being substituted in its place. Of course our tools do not last as long as formerly. Were there time it could be shown that each and every kind of wood has special qualities that adapt it for specific usefulness. The more we advance in the commercial, industrial and manufactures we continue to discover new economic uses for all of our raw materials and products. There is not a species of wood grown at present but has a recognized standard of value. The time has come when simply the growing of cordwood in most sections of Massachusetts is a promising crop; particularly is this true where the burning of brick is an important industry

As long as the prices of forest products remained low we laughed at the idea of forest depletion. Experience is a wise teacher and although the histories of older countries point out very clearly the mistakes they have made, their errors are seldom heeded in a new country until many of the same experiences have resulted.

"Forestry is the science and art of forming and cultivating forests; the management of growing timber." Forestry, therefore is concerned with the economic production of merchantable wood and timber. Forestry should rightfully be thought of as a commercial industry. The forest products of a country should be one of her greatest assets, just as much as that of any other crop agriculturally speaking, and even more to be relied upon than our income from mining, for, with proper management, the investment will be permanent, inexhaustible, and hence fundamental to the nation's life and prosperity.

Lumbering is as important to successful forestry as is the digging of potatoes or the harvesting of any crop when it is ripe. The same essentials of culture also must be understood in getting maximum returns in the one case as in the other.

Forestry and commercial forestry are synonymous terms. Forestry in its true sense, when managed properly, will utilize our three million acres of land in Massachusetts at present seen scattered in every section known as waste land, abandoned pastures, sprout lands, barrens, plains, etc., returning them to forest culture. The same culture that will return saw logs to our mills, make work for our country folk in winter, replenish our town treasuries, repaint the old red schoolhouse, pay the sexton to again ring the church bell, make better roads, and, in short, return the former substantial livelihood of country life, will also conserve moisture, protect and enrich the soil, give an equitable climate, and return to Massachusetts and New England the natural beauty we all so much would love to see.

If commercial forestry will do this, the aesthetic man who now and then sets out a shade tree and spends more time criticizing the practical lumberman can employ his time to better advantage.

Our portable mill operators who are to be found in nearly every country town are generally speaking our best and most public-spirited citizens, and as a matter of fact the leaders of the communities. These men also are the most approachable men in the world and willing to foster and further every reasonable and commendable project. These men I am confident will be the men of the future to be relied upon to do things in forestry. The fact that the forest products are valuable and likely to increase rather than diminish, it being an easy matter to demonstrate even at present prices that reforestation and better forestry management will pay, gives life and interest to the undertaking.

(To be Concluded.)

—The annual meeting and banquet for 1908 of the American Paper and Pulp Association and the meeting of the National Paper Trade Association will take place at the Waldorf-Astoria, New York City, on the 6th prox.

WHAT THE LUMBERMAN WASTES.

By J. A. DeCew, Chemical Engineer, Montreal.

There are two distinct ideas that may be conveyed by the expression, "Waste Material." One is that the material is absolutely worthless, and the other is that a destruction is taking place of certain values which really exist in the material, and would be obtained if certain work were done upon it. In the latter case these values referred to are latent, and only become real after the intelligent application of energies which produce from the material worked upon something which supplies a demand.

The stumpage value of timber is a latent value of this kind, because unless work is done upon the tree, and a marketable commodity is produced from it, it will finally die and decay, and no actual value will have been brought into existence.

The value of a tree upon its stump is undoubtedly the difference between its value at the market and the cost of getting it there and into marketable form. In the same way we can reason out the value of any raw material, by deducting from the value of the finished article the cost and profit in manufacture. Can we not in this way, therefore, form some idea as to what is, and is not, a waste material?

If a lumberman leaves in the woods the stump and branches of a tree because by bringing them out he will lose money, this does not constitute a waste of material, in the sense that we are now interpreting the word.

But if these forms of wood have latent values that their owner does not fully appreciate, and through lack of knowledge of the processes and means of obtaining these values, they are never brought into existence, then we have in this instance an example of a wasted material.

Since there has been, in recent years, a great increase in the values of all wood products, there has suddenly sprung into existence an enormous amount of waste material, and in order to prevent this waste, the lumberman must engage in the production of new materials, which may be considered the by-products of his industry.

The first question that may arise in the mind of the reader in case he is a lumberman, is, What have I under my conditions that is a waste material? It is impossible to answer such a question without knowing all of the conditions, but, in a general way, we may say that practically all which goes up in smoke in the refuse burner and a fair portion of that left in the woods, is a waste of good material.

Ten or twenty years ago, perhaps, we could have said that this material must be destroyed in some way, because nothing of value could be produced from it with profit, but now these conditions are entirely changed.

The great inroads made upon our wood supply by the pulp and paper industries have produced values in raw material which settle themselves upon every form of wood that can be used in the manufacture of paper.

Although the value of any wood for this purpose depends upon the variations in the quality of product produced, and the cost of production, yet as a raw material for paper-making there is practically no limit (except an economic one) to the varieties of wood that may be used.

Amongst Canadian woods the spruce, pine, hemlock, balsam, poplar, basswood, birch, maple have all been used; and there is no reason why we should not use many other species, if convenient, because it is merely a question of cost of production. The structure of the cellulose fibre that can be obtained from the oak or cedar would indicate that, for paper-making, it would be superior in many respects to some of the woods already mentioned.

How to obtain the maximum values from any given waste material will depend, of course, on many conditions,

but while prices of cellulose pulp remain at or near their present level it can be easily shown that much valuable pulp-making material is now being carelessly destroyed.

A newspaper consists almost entirely of spruce, a portion of it being in the form of sulphite fibre and the rest in the form of ground wood.

The reason that the newspaper is made from spruce is that this wood adapts itself readily to the grinding process of making mechanical pulp, and also the sulphite process of making chemical pulp, and for this reason it is likely that our news always will be printed on spruce.

For other classes of paper, however, pulp made by the alkaline processes has many advantages, and by these processes practically any kind of wood can be economically converted. This, then is the method of exploiting the waste products of the lumber industry, and the adaptation of the processes to these materials has already passed through the experimental stage.

Some lumbermen are recovering a certain amount of turpentine from their pine waste, while others are making a cellulose fibre, but the fact that both of these products can be recovered in one process has not yet been fully appreciated.

In a wood which is very rich in resinous matters it is profitable to recover the rosin as well as the turpentine and pulp, for the value of these materials is now at a high level and increasing all of the time.

There are other chemical methods of utilizing woods which, in particular cases, have a commercial importance, but none of these contain such possibilities of profits as exist in the method we have just outlined

SIR WILLIAM VAN HORNE ON PULP-WOOD EXPORTS.

Sir William Van Horne again expressed his view of the present and future prospect for pulp-wood in an interview last month in Montreal: "The time has arrived when the Canadian people must take action to protect the pulp areas of this country if we are to reserve them for Canada, and prevent the United States manufacturer from decimating our forests and injuring our water supply. When I tell you that Americans own 10,000 square miles of timber limits, nearly all in the Province of Quebec, you will probably realize to some extent the seriousness of the situation. Now this means that unless something is done, and done quickly, to prevent the wholesale exportation of pulp-wood, the United States paper mills will in time denude our pulp-wood areas. If, however, the Federal or Provincial authorities take action and prohibit the Americans taking away our pulp-wood in such tremendous quantities, we will be in a position to force the United States mills to locate on this side of the line. Of course the American paper manufacturer is anxious to have no export duty on Canadian pulp-wood, for it will be then easier for him to secure all he requires, so as to keep his mills running overtime, and with what result may I ask? Well, to keep the Canadian paper manufacturer out of the United States market. Now let us cut off the supply of pulp-wood, and in six months you will find American capitalists erecting paper mills in Canada."

—F. Maclure Sclanders, St. John, N.B., is said to have discovered a process for producing good pulp from hardwood, particularly birch. Instead of elaborate digester apparatus, under this process there are iron drums, six feet in diameter and about ten feet long. Each of the drums is said to be capable of producing half a ton of pulp from the chips in about three hours, or, allowing time for cleaning, recharging, etc., between three and four tons of pulp per day. A plant of ten of these machines, it is estimated, could be installed for about $25,000. One cord of hardwood, it is estimated, will produce one ton of pulp.

A SWEDISH MAKER ON KRAFT PAPER.

A Swedish paper manufacturer says i· Papier-Fabrikant that the production of kraft paper cannot be described in a series of rules any more than that of any variety of paper. The chief point is said to be the right selection of the wood used and the choice of the lye best adapted to the properties of the former.

As the preparation of the cellstuff for kraft papers has of late been principal'y effected by the sulphate process (in light and dark tinge), the color should be carefully watched by drawing samples from the cooker. In this way two tinges are produced, in one or other of whi-h the paper is made. Dark colors are obtained by means of Kassler brown or other agents, while yellowish golden brown shades are produced by aniline, the designation "natural color" being thus justified. The sulphite process is referred to as the cheapest and most effective, but the soda process is also used, particularly when the latter article is cheap. The wood should be chopped into lengths of not more than about 1 3-5 inches. Some factories saw the wood, but only for special purposes.

When the cellulose has been washed either by the action of water in pulp chests with holes or by means of washing hollanders, it is subjected to a process which gives it toughness, provided that the proper wood has been treated in the right way in the preparatory processes. The pulp is then conveyed into the hollander to be brushed and otherwise treated by means of dull knives, being thus still more finely divided before entering the paper machine.

Kraft papers smooth on one side require special attention from the machinist. The thin descriptions should be worked with abundance of water on the wire. The lower felts should be of open make and the upper cloth not too thick. The heating must not be too great, so as to avoid bubbles. Watermarks and lines are mostly produced by the lower felt, but are likewise made by the upper felt, or by an intermediate one.

The manufacture by machine of kraft papers smooth on both sides differs but little from that of other papers. It is remarked that the German system of machines with a number of cylinders is the most suitable, such machines being adapted to the production of silk papers as well as of thicker descriptions. The wet felts should not be too fine, and for the dry ones wool is considered preferable to cotton. With a view of avoiding bubbles and waste, the mach'ne shou'd not be driven too quickly. Transverse cutters are best suited for these papers, particularly those of a silky character, the paper being wound on a drum.

Kraft paper is specifically lighter than all other commoner papers, and atta'ns the same effect as would require several sheets of thick paper of ordinary-quality. Reference is finally made to the growing appreciation of this class of paper in America, Canada, England and elsewhere, as shown by the efforts being made to introduce its manufacture in the respective countr'es.

A recent German invention has for its object the manufacture, out of brown pulp (without the addition of cellulose, rags, esparto, etc.), of opaque printing paper, which can be printed on both sides, and which, even in thin grades, is sufficiently strong to allow of its being used on a quick running machine.

The invention is based on the fact that brown pulp when electrolytically bleached in the manner usual for fibres and cellstuffs undergoes a marked change in its structure, strength and felting properties, the product differing alike from ordinary white pulp and from brown pulp. These properties extend to the paper made from the pulp thus treated. Another advantage claimed is that the addition of cellulose is not required for making strong paper, the color being moreover a good white.

Brown ground wood (from wood previously steamed) is either bleached electrolytically or by a bleaching fluid ob-

tained by electrolytic process from a solution of salt. The pulp must, however, be of fibre long enough to ensure a good felting on the paper machine. When the pulp has attained the necessary degree of whiteness it is run off into settling chests, where it is left for twenty-four hours, being then ready for use on the paper machine.

A case is mentioned in which the addition of 10 per cent. of mechanical spruce wood pulp to a kraft paper increased the hardness of the sizing to a most remarkable extent without appreciably affecting the tenacity of the paper. This circumstance is attributed to the influence of the finely ground shreds of the mechanical pulp in closing the texture of the sheet of long and strong chemical kraft fibres. Since mechanical pulps differ in hardness very considerably according to the conditions of grinding, it is probable that the effect recorded depends chiefly on the proper selection of exactly the right type of mechanical for the purpose.

NEW YORK EXPERT'S VIEW OF BRITISH COLUMBIA.

Geo. F. Hardy, of New York, the engineer and mill designer, and one of the most prominent pulpwood experts of the United States, has been engaged to report on the plant of the Canadian Sulphite Company at Swanson Bay, B.C.

"Although this is my first trip to the coast, I am more or less informed respecting the great natural forest wealth of British Columbia," said Mr. Hardy in an interview in Vancouver. "There is no doubt of a vast pulpwood industry in British Columbia. It will practically have no limitations, owing to the abundance of raw material, like fir and spruce. The natural markets will be Australia and the Orient. The consumption of pulpwood in Eastern Canada and in the United States is yearly assuming larger proportions. The problem of securing raw material is already receiving attention from manufacturers. At the present rate of consumption it is only a question of time until greater precautions for preserving the spruce forests will have to be adopted. Regulations respecting the minimum size of logs cut for paper-making have already been adopted by all the large manufacturers. The day is not far distant when they will have to look to the Pacific coast for their raw material. That means the building up of a big industry in Oregon, Washington, and British Columbia. For the present, and for some years to come, your best market will be on the other side of the Pacific."

PROF. FERNOW'S GIFT.

Professor Fernow, head of the Department of Forestry in the University of Toronto, has donated to the library of the University for the use of students in his department his entire collection of more than 2,500 books, pamphlets and magazines dealing with forestry and kindred subjects. Dr. Fernow has been a careful student in this department for twenty-five years, and the gift of this collection, almost unique among those of this continent, is highly appreciated, not only by the Board of Governors of the University, but by all those interested in forestry.

—Not long ago we announced the publication of the third edition of Merck's 1907 Index, an encyclopedia of drugs and chemicals. While issued for users of chemicals in the United States, applications from Canada have been so numerous that the publishers, Merck & Co., of University Place, New York City, have set aside a number of copies to meet these calls. So long as these reserved copies last, the publishers will send the book to any chemist, physician, or proprietor of drug store, upon receipt of three shillings and sixpence, or eighty-five cents.

IMPERIAL PAPER MILLS AFFAIRS.

According to a recently issued report, the total liabilities of the Imperial Paper Mills of Canada, Limited, Sturgeon Falls, Ont., at the close of the last fiscal year, August 31st last, amounted to $5,220,241, comprising $2,000,000 of common stock, and $1,050,568 in second-issue debentures, interest and premium sinking fund. Besides preferred stock and prior lien debentures, the receiver's liabilities are stated at $192,438, and other liabilities at $951,375. Total assets were $4,515,488, purchase and development of the property representing $2,190,907, and machinery, limits, etc., being estimated at $1,615,633. The debts receivable, cash in hand, etc., were $261,934. Carried to balance sheet, $704,753.

The official referee of the High Court of Ontario has given permission for the mills to be operated under direction of E. R. C. Clarkson. It was stated in the petition, asking for this step that orders had been received for the entire output of the mills for a long time to come.

The town of Sturgeon Falls is bringing an action against the mills for taxes due. One or more inquiries as to those mills are reported from United States capitalists, with a view to purchase.

NOVA SCOTIA SPRUCE.

It is conceded by many of the largest lumber operators, that Nova Scotia possesses the largest growth of spruce forests in North America. From actual measurements it has been ascertained that an average growth of two inches in diameter is made every five years, owing probably to the genial and moist climate. A steady growth seems to go on perpetually from the time the young trees are a few inches to maturity, fixed at 100 to 150 years. Nova Scotia has reached its maximum cut of lumber. How long can this be maintained? Owing to absence of forest fires, fire protection laws and a radical change in the ideas and methods of timber land owners and operators, who now refuse to sell their stumpage, except under conditions of restricted cutting, and rapid growth of the spruce trees and better methods of lumbering operations, there is every reason to believe that the present cut of lumber in Nova Scotia can be maintained. With the increasing price of the product, the value of the export, a leading feature in the trade, will in all probability exceed in the future, what it is at the present time. It would be a good thing for Nova Scotia when the country to the west and south is devastated of its timber, to still have forests and a goodly supply of timber.—American Lumberman.

—Among those interested in the project for building large pulp mills near Port Arthur is William Scott, manager of the Pigeon River Lumber Co., of that city. The syndicate represented by him has applied to Port Arthur for 50,000 horse-power electrical energy.

—A card of New Year's greeting from S. Charles Phillips, M.S., C.S., etc., editor and proprietor of "The Paper Maker," "British Paper Trade Journal," and other trade papers, 47 Cannon Street, London, E.C., is acknowledged by the "Pulp and Paper Magazine," and heartily reciprocated.

—We have received from the Eastwood Wire Manufacturing Co., Belleville, New Jersey, a copy of their calendar for 1908. This well-known firm manufactures wire cloth, cylinders, dandies, screen plates, sulphite fittings, steam valves and fittings, castings in iron, bronze, brass, copper and aluminum.

—The almanac issued this year by the Paper Makers' Chemical Co., manufacturers of rosin size and Excelsior Cleaner, importers of china clays for paper-makers, potteries, etc., Easton, Pa., is one of the very best we have seen this year, artistically speaking. The illustration is a reproduction in natural colors of the well-known French painting, "The Cavalier." As a picture for the office wall it is well worth having.

PULP DISCOLORATION.

In the production of a certain grade of cardboard, where particular softness and suppleness were required in conjunction with a high degree of toughness, a correspondent of the Papier Fabrikant reports a curious discoloration of the pulp, which he thinks of interest to manufacturers of the article.

He had used, among other components, old manila rope (in most cases tarred), chopped with a small axe into pieces of 3 or 4 inches in length and then unravelled, further treatment in the rag cutting machine being considered to call for too great a use of power and being therefore omitted. The rope was boiled in a spherical rotating boiler with caustic soda for sixteen hours, without, however, the addition of lime, although it was feared that without the latter it would be impossible to extract the tar. The combination in the necessary degree of the lime with the caustic soda lye only takes place at about four atmospheres (or about 57 pounds per square inch), while it was not thought safe to exceed about 43 pounds with the boiler in question. The time of boiling was therefore lengthened.

After the boiling and blowing off washing followed with previously heated boiler feed water, without any chemicals for the prevention of incrustations being added. The boiler was then emptied, the pulp after fifteen minutes having a slight reddish tint, which gradually became more intense, but being only on the surface was considered to result from the chemical action of the lye on the tar left in the rope and the subsequent exposure to the air. Beneath the surface of the color was still a dark grey, and when the pulp was stirred the new surface became discolored in ten to fifteen minutes.

During the subsequent washing and grinding in the hollander this red tinge became more apparent, until it permeated the whole of the contents. In the settling vessels the surface still retained the color, while the lower portion gradually lost the tinge. Stirring produced the same results as previously reported.

While in the case in question the fact that the rope pulp was to be used unbleached and in limited proportion to the entire quantity of material prevented any real injury from the cause named, it is remarked that it would operate disadvantageously when the product was intended to be white or of delicate shade. It is suggested that in the latter case alkaline hydrosulphite solutions would produce neutralizing effects. The writer of the article invites his colleagues to record their experiences and opinions on the point dealt with by him.

CARTHAGE WOOD-PULP GRINDERS

The Carthage Machine Company of Carthage, N.Y., write that 1907 was their most successful year. They had a remarkable run on the Carthage grinder, which is the strong, durable efficient machine evolved from years of experience in building ground wood machinery. They have no hesitation in saying that it will turn out more pulp on the same power than any other. A few of the installations of the Carthage grinder are the Raymondville Paper Company at Raymondville, N.Y., where they have 12 installed. At the West End Paper Company at Carthage, N.Y., they have 4; at the Finch-Pruyn Company at Glens Falls, N.Y., they have 18 and are now building 2 more for them. Roanoke Rapids Paper Manufacturing Company at Roanoke Rapids, N.C., have 4, and the Eastern Manufacturing Company at South Brewer, Me., have 2. The company has just shipped 3 for the Island Paper Company of Carthage, who are throwing out all their old grinders.

—It has been decided to hold the next meeting of the Canadian Forestry Association in Montreal some time in March, the exact date not being yet fixed.

IMPORTANT FORESTRY APPOINTMENT.

The staff of the Forestry Branch of the Dominion Interior Department has been greatly strengthened by the appointment to the position of Inspector of Forest Reserves of A. Knechtel, lately the Forester employed by the New York State Forest, Fish and Game Commission. This is but one step in the direction of enlarging and strengthening the staff of the Forestry Branch, which is being done as rapidly as trained men become available. It is also a good example of the fact that the tide is turning in the direction of Canada, and that Canadians who have gone over to the United States are finding that Canada is now offering greater opportunities.

Mr. Knechtel is a native of Huron County, Ontario, where he helped to clear his father's farm. He taught school for a number of years in Canada and afterward in the United States. He completed the three years' agricultural course in the Michigan Agricultural College and graduated with the degree of Bachelor of Science. His forestry course was taken at Cornell University, where he received the degree of Forest Engineer from the New York State College of Forestry. While teaching school and attending college he spent his vacations looking after the work in a sawmill owned by him in Muskoka.

After completing his course he was first employed by the United States Bureau of Forestry in making a study of the natural regeneration of the commercial trees of the Adirondacks. Since that time he has been the Forester for the Forest, Fish and Game Commission for New York State, under direction of which he made a classification of the forest lands of the State, established forest nurseries, superintended the planting of 500,000 trees in the Adirondacks, organized the work of collecting forest tree seeds and took charge of the fire protective service.

In 1904 he made a four months' tour of Europe, visiting France, Germany, Austria, Switzerland and Italy, studying and photographing the forests. Mr. Knechtel has published a number of bulletins and articles on forestry subjects. Some of the more important are: The Cultivated Forests of Europe; Methods of Estimating and Measuring Standing Timber, and Making a Woodlot from Seed.

PULPWOOD AND PEANUTS.

"Toronto Saturday Night" relates how Rev. J. A. Macdonald, editor of the Toronto "Globe," "got even" recently with an American speaker of the spread-eagle type, who had been boasting of the marvellous resources of the United States. This speaker (who, by the way, was the Governor of a Southern State) had been waxing grandiloquent over the fact that the United States supplied the world with 50 per cent. of this, 80 per cent. of that, and 97 per cent. of its peanuts. Mr. Macdonald warmed to the occasion. "It may be true," he said, "as we have been so beautifully and eloquently told, that you supply the world with 97 per cent. of its peanuts, but it is also true that your mills are starving for the pulp from the forests of New Brunswick and Quebec. As the nations of the Old World watch the growth and development of this North American continent, what a noble sight it will be to see on the northern half a nation built upon a pile of pulpwood, and on the southern half a nation built on a pile of peanuts." The point told, but the Americans took it good-naturedly, and joined in the general cheer.

—The Moreau Barking Machine Co., Limited, St. Hyacinthe, Que., send us a copy of their illustrated catalogue. It describes the Moreau barker, which, as is well known, records a vast improvement in the important process of barking wood economically. The catalogue is printed in both English and French, thus doubling its usefulness.

WET-BEATEN PULP.

Carl Eichhorn gives his views on the question of the preparation of wet-beaten stuff. The first condition for obtaining wet stuff is the proper ratio between the number of knives on the roll and the number of knives in the bed-plate. The old-fashioned beaters of small capacity had very light rolls, in fact when dense masses of fibre came under the roll, the latter used to jump up. These light rolls, even when hard down, used to give wet-beaten rag stuff of very strong quality, because the pressure per square inch of bed plate was only small, whereas a modern heavy roll working on the same or only slightly larger bed-plate would tend to cut the fibre into small fragments. The work of the beater roll is not entirely expressed by the number of knife-strokes per revolution; a roll with 60 knives on a bed-plate of 15 knives would give 900 strokes per revolution, so would a roll with 900 knives on a bed-plate with the knife, but the effects would be very different. In the latter case every fibre would be drawn between the knives end-on, and every stroke would be a cutting stroke. With a broad bed-plate with several knives the fibres take a complicated path across the bed-plate, being thrown slant-wise and cross-wise, and receive the strokes in every conceivable direction. For wet-beating, the bed-plate must be much broader than usual, and with a heavy roll the bed-plate should contain at least 35 to 40 knives. If then the knives of the roll be broad, the pressure per square inch of bed-plate may still be as low as in the case of the old-fashioned beaters, and it will be impossible to beat the stuff " dead " even when the roll is down. But, however, favorable the design of the beater, wet stuff can only be got by loading it in a very concentrated state. For this class of work rapid travel of the stuff is not desirable, and with Eichhorn's patent circular, the pulp still has a sufficient travel even at 20 per cent. concentration. In the writer's opinion stone beater rolls are not suitable for the wet-beating of rag pulps. For the preparation of wet-beaten sulphite pulps for grease-proof papers, the details of construction as regards the ratio of the number of knives on roll and bed-plate are somewhat different from those required for rag pulps. The general principle is, however, the same, broad knives on the roll working on a comparatively large number of broad knives on the bed-plate. A certain " lashing " action on the pulp is necessary in addition to the beating, and the travel is so slow as to be scarcely perceptible.

—The British American Wax Paper Co., Limited, Toronto, manufacturers of all grades of wax paper, and owners of the Canadian patents for Kiss wrapping machines, send us a card of Xmas greetings, which we hereby acknowledge with thanks.

—As intimated in last issue, the business of the late John Christie, pulp broker, is being carried on at the old address, 5 King Street West, Toronto, under the name of the John Christie Co. It is being conducted by the widow under the management of her son, W. F. Christie, and daughter.

—The Canadian Pacific Sulphite Pulp Co., Limited, Vancouver, B.C., is now at work on the construction of its pulp mill buildings, and expects to have machinery installed by July or August next. There is now a thriving colony at Swanson Bay, where comfortable cottages have been erected for the married men. The sawmill, dock and Front Street are lit by electric light; also the cottages. A fine dam has been built on the Swanson River, above the works, and the water-power will be available in a few weeks, the pipes conveying the water from the dam now being laid. Twelve hundred horse-power can be developed from this source. The machinery for the pulp mill is not yet all ordered, the details being in the hands of G. F. Hardy, of New York, one of the leading engineers and pulp mill experts in the United States.

EFFECTS OF CHLORIDE OF MAGNESIA.

It seems certain that the injurious effect of caustic alkali on the durability of parchment paper can be obviated by the use of chloride of magnesium. This useful result is no doubt referable to an interaction. Otherwise the magnesium chloride and the caustic alkali employed in parchmenting. This interaction may be expressed by means of the following equation:—

$$MgCl_2 + 2\,Na\,HO = Mg\,(HO)_2 + 2\,NaCl.$$

The resulting products, viz., hydrated magnesium oxide and common salt, have neither of them any detrimental action upon the paper.

It is of course essential that the reaction between the magnesium chloride and the caustic alkali (which is caustic soda in all commercial operations), should not be anticipated for many chlorides, including those of magnesium and aluminium, have a most injurious action on paper, which is not much less than that of free mineral acid, and is in fact due to the separation of mineral acid by dissociation. For example, with magnesium chloride. we have the equation:—

$$MgCl_2 + H_2O = MgO + 2HCl.$$

If this happens, as it will do, unless there is free alkali present, the condition of affairs is not much improved. There is in fact the dilemma of choosing between the injurious action of caustic alkali left in the parchmented paper, and the injurious action of excess of magnesia resulting from the weighting of the paper. At ordinary temperatures the dissociation of the magnesium chlorides expressed by the second of the above equations takes place very slowly, but even then makes itself felt when the parchment paper has been on the shelves for a month or two. If the parchment paper is used to wrap up hot articles, the destructive action is greatly accelerated.

As this is a matter of great commercial importance, the writer has instituted a number of experiments which are described below.

To arrive at some certain conclusions as to the durability of various parchment papers, numerous samples were subjected for a short time to moderate heats, whereupon the strength of the fibre was taken by the usual methods, and compared with that before the heating. The comparative tests were carried out with parchment paper containing from 7.2 per cent. of magnesium chloride downwards. The figures obtained show clearly that at low temperatures there is no dissociation of the magnesium chloride, and consequently no danger of any destruction of the vegetable fibre by free hydrochloric acid. Hence the protective action of the haloid salt is complete. On the other hand, if the temperature is allowed to rise, the action of the magnesium salt or the caustic alkali proceeds further. The hydrate of magnesia set free by the caustic soda from one portion of the magnesium chloride forms magnesium chloride with the hydrochloric acid formed from other portions of the chloride, and that the whole action constitutes what is known as a "continuous process," which is very detrimental to the fibres in amongst which it is exerting its energies. Even at heats not much exceeding 60 degrees C. to say nothing of boiling temperatures, parchment papers filled with magnesium chloride are rapidly destroyed. While the caustic magnesium set free is kept free by the high temperature, or reacts with the caustic soda, if the substance is also in presence, the hydrochloric acid liberated from the magnesia rapidly destroys cotton, which, as is well known differs from animal fibres in having a small resistance to acids.

The practical conclusion to be drawn is this—that when magnesium chloride is used as a paper-filling by itself, the paper filled with it will not stand either high temperatures or low stocking.

Heat and time, or either of them separately, dissociate the magnesium chloride when moisture is present (and when it is not under commercial conditions?). This effect is very rapid as a rule, because under ordinary circumstances heat and moisture in the air generally occur together, and help each other. The result is the above-mentioned action of the mineral acid formed from the chlorine of the magnesium chloride and the hydrogen of the atmospheric moisture. If, on the other hand, magnesium chloride is used at ordinary temperatures on a parchment-paper so as to neutralise any free alkali present, and is not added in excess, the action of the alkali is prevented, inasmuch as it forms common salt and hydrate of magnesia, according to the equation above given; while, at the same time, the heat required to dissociate the excess of magnesium chloride and hence to cause tendering by free hydrochloric acid, is either removed altogether or reduced to a minimum. Hence we have the advantage of the magnesia salt in checking any detrimental action on the part of caustic alkali without any fear of different but yet equally injurious action due to its dissociation.—Papier Fabrikant.

PARCHMENTIZING PAPER

T. H. Norton, United States Consul at Chemnitz, gives the following particulars of a new process of treating paper so as to make it waterproof or parchmentlike.

There are several methods now in vogue here for rendering paper and pasteboard waterproof which might advantageously be utilized in the manufacture of paper and cellulose vessels. One, especially applied to cellulose, consists in treating the sheets with a hot mixture of asphalt, turpentine and linseed oil solution of glue. Another consists of saturating cellulose articles in a solution of rosin in a mixture of petroleum, linseed oil, and paraffin oil. Solutions of varnish in linseed oil are likewise employed for rendering a surface waterproof.

A process which has given good results is the following: Articles of paper or cellulose are soaked thoroughly in a solution of rosin soap. They are then immersed in a hot bath of zinc chloride, passed between rollers, are well washed, dried in a hot room, treated with paraffin oil, and finally run through a calender. The resultant products are strong, tough, and pliable. A waterproof pasteboard is secured by immersing sheets of ordinary paper in a bath of nitric acid or the solution of a nitrate, placing the sheets one on top of another, and then submitting them to heavy pressure. I am personally inclined to regard experimental methods, based upon the fundamental principle of exchanging paper into vegetable parchment, as promising the most success in this field. Waterproof cardboard has already been manufactured by pressing tightly together freshly prepared sheets of the vegtable parchment before being dried.

The operations in parchmentizing paper, like those in tanning, are essentially chemical, and effect a remarkable change in physical properties. When carried out with partly diluted sulphuric acid (two parts acid of 66 degrees to one part water), sheets of pure cellulose paper are immersed for a few seconds in the liquid, then thoroughly washed in water, dipped in an alkaline solution (ammonia or sodium carbonate) and washed again. This brief treatment suffices to bring about the following changes: The thickness of the paper decreases from 34 to 37 per cent. Its specific weight increases in the same ratio. The strength is tripled, and even quadrupled. There is a notable increase in homogenity and transparency. The product is unaffected by boiling water, i.e., is not softened and disintegrated, as in the case with ordinary paper, while it has an increased affinity for tinctorial substances.

Chemically, the brief exposure to the action of sulphuric acid has changed the exterior of the cellulose fibres to a gelatinous mass, the so-called amyloid, intermediary between cellulose and dextrine. This gelatinous amyloid binds the fibres so closely and intimately together that they form a continuous mass, which, being totally insoluble, constitutes a waterproof substance. With the microscope it is easy to see that parchment is a sheet of cellulose fibres, each one of which is covered by the thin transparent coating of amyloid, the interstices or pores likewise being completely filled with the same substance. It is essentially a surface action which has taken place. Ideal conditions of success are relative thinness of the paper employed and a complete absence therein of gluey substances and minor matter. Sulphite acid can be replaced by an aqueous solution of zinc chloride or an ammoniacle solution of cuprous oxide.

In order to render paper vessels waterproof, the essential features of the parchmentizing might be applied to their external surface. This would involve no material increase in the strength of the entire mass. Another and possibly more promising method would be to apply freshly formed sheets of vegetable parchment under strong pressure to the inner and outer surfaces of the article. It will probably be found that improvements in the manufacture of paper vessels, aiming at an increase of tenacity, can preferably be brought about by mechanical operations quite distinct from the chemical reactions producing waterproofing, although both of these advanages are secured by a single change in the case of the preparation of thin sheets of paper parchment.

WORKING UP OLD PRINTINGS.

Used printed paper and paper cuttings have now an important place among the raw materials of paper manufacture. So much is this the case that large establishments exist for sorting purposes only, and many middlemen occupy themselves entirely with paper-scraps, printed or otherwise. The sorting depends upon the kind of new paper for which the old is to be worked up. The old paper which is the subject of this article is naturally obtainable in practically unlimited quantities, but its working up is confined to the product of inferior quali-

FOR SALE

One second hand revolving rag boiler, in first-class condition, driving gear and all complete, Dimensions : 6 feet diameter by 25 feet long, with 2 doors, working pressure 50 pounds per square inch. For price and further particulars apply to the Cornwall Paper Manufacturing Company, Mille Roches, One.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

POSITION WANTED.

Superintendent open for Engagement.

A1 on Book, Bond, Blottings and Coating Stock 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc. Address M. R. J. care Pulp and Paper Magazine, Toronto.

Position Wanted

A mill manager, having experience in the manufacture of Kraft Brown both in Sweden and England, is open for an engagement with a Canadian mill. Is able to take charge of a paper mill as manager or assistant manager. Address "Kraft," c/o Pulp and Paper Magazine.

Position Wanted.

Tour Boss for 12 grinder ground wood mill ; must be first-class pulp maker, and have good knowledge of machinery. Good wages for right man. Address: "J. A. B." care of the Pulp and Paper Magazine.

WANTED

FIRST CLASS CUTTERMAN (News), one used to Dillon Cutter preferred. State wages, The Belgo Canadian Pulp & Paper Company, Limited, Shawinigan Falls Quebec

ties of new paper, on account of the printing ink on it, which always gives a more or less grey tint to the half stuff obtained by disintegrating the paper.

The chief points to be borne in mind in working up waste printed papers, is, that the new paper must be at least as good as the original paper, i.e., capable of being used as that paper was, that no special plant should be needed, and that the cost of the process should not be prohibitive. If these conditions are fulfilled there is no reason why the same cellulose should not be converted into paper many times over. There must of course be an end to this economical procedure, when the fibres are broken up so much that they cannot form a web.

It is clear from what has been already said that the chief difficulty in the way of obtaining a useable pulp from printed papers is presented by the printing ink, and means have therefore to be sought of getting rid of this substance. The indelibility of printing ink is proverbial, but although it cannot be removed without disintegrating the paper, it can be removed after or during that disintegration.

Taking the chief sort of printed paper, viz.: old newspapers, we find an inferior paper made of wood-pulp, cellulose and fillings, the printing on it may be regarded as the result of the drying of a mixture of finely divided lampblack with an oily vehicle. On examining a printed letter under a high power, the black particles of lampblack and the grey dry residue of the vehicle can often be clearly differentiated.

The principle which underlies the removal of printing ink from paper is thus obviously to employ agents which will destroy or dissolve the vehicle which binds the lampblack, or other pigment (colored printing inks are now in extensive use), to the paper.

The first step is to tear up and disintegrate the waste paper in the ordinary manner. The resulting pulp is sieved, and it will be found that while the fibre remains on the sieve almost entirely, a fine sieve being of course used, a large part of the pigment which has been mechanically loosened from the fibre during the disintegration of the same passes through, together with much of the binding vehicle and nearly all the weighting and filling bodies present in the original paper. This, of course, much facilitates the subsequent treatment, as the pulp from the sieve is already partly freed from ink and other foreign bodies. One process to which it may be subjected is that of Knopf (German patent 127,820). This inventor treats the pulp from the sieve with soap-solution. It is then sieved again, and the soap carries most of the remaining pigment, which it has loosened from the fibre, through the sieve. The amount of soap required naturally varies within wide limits, i.e., from 3 to 22 per cent. of the weight of the waste paper, according to the character of the paper, and the nature and amount of the printing ink present. The pulp on the sieve is rinsed free from the excess of soap with water. It is essential to work the process throughout without artificial heat, especially when it is a question of cheap printing inks made from rosin oil. Heat would induce oxidation of the vehicle, and enable it to resist the solvent action of the soap.

Another method (German patent 71,012) depends on the use of petroleum. The paper is soaked with the mineral oil, disintegrated, and boiled with caustic soda. On sieving the pulp it is said that all the pigment passes through the sieve in suspension in the lye. Yet another is the subject of German patent 75,447, a comprehensive document, which seeks to protect the use of very different agents for removing the ink from the paper, such as the rosemary oil, oil of turpentine, bleaching powder, etc. The futility of using expensive substances for working up cheap paper is obvious. German patent 88,563 directs that the printed paper should be first soaked in water, and then in a cold mixture of carbonate of potash and decoction of garlic.

REVENUE FROM GERMANY'S FORESTS.

Now that Canada's forests have become such a live issue, and the subject of forestry is receiving so much attention, the report of a United States Consul in Germany (W. C. Teichman), giving the actual results of scientific conservation in that country, will come very opportunely.

Official figures recently compiled by the Saxon Government for the year 1906 demonstrate, he says, a net revenue of $2,126,037 obtained from the cultivation of 443,105 acres of government forest land, an area of which 424,246 acres represent land covered with trees or soil designated for rotational foresting. The total area of the kingdom of Saxony amounts to 5,789 English square miles, of which almost one-half is covered with private and governmental forests. The State Treasury places the latter as its highest revenue producer after the State railway, and exceeding the income from all other sources, taxation included. The total quantity of timber cut during the year is estimated at 1,231,472 solid cubic yards, 210,947 cubic yards representing wood used for fuel only, and 1,020,525 sold for all other purposes. To this must be added a yield of brushwood, cut and sold for fuel use principally, of 190,415 cubic yards, raising the total quantity of timber and brushwood cut and sold in 1906 to 1,421,887 cubic yards, for which the sum of $3,374,385 was obtained, which amount was still increased by additional revenue from the leasing of meadows, hunting privileges and other rights to the total of $3,483,616.

Deducting from this total figure the cost of forest cultivation (with salaries and wages of the entire service included) amounting to $1,357,580, the net profit of $2,126,037 was added to the State Treasury in 1906. There is nothing unusual in the result, as the ten preceding years show equally high figures, a few slightly exceeding the revenue of 1906, others being lower to a very small degree. The same comparison applies to the area cultivated and timber obtained in ten years.

Similar results have been achieved in other German States by systematic forest cultivation. Nearly 50,000 square miles of German soil, representing about one-fourth of Germany, have been adapted to foresting, the value of the wood gained therefrom being estimated at $60,000,000 per year. In all the German States revenue for the State Treasury is the paramount consideration in determining the species of trees to be planted on Government land. Formerly the deciduous tree varieties were planted in preference to the needle leafed kind. The prinicpal demand for the former was for fuel purposes. However, since coal has replaced the deciduous tree in this respect the price for such wood has fallen accordingly. On the other hand, that of the needle leafed steadily rose until to-day it has become more profitable to plant the latter. This rise is largely due to growing industrial demands for this variety of wood for raw material.

The gradual increased cultivation of pine forests in the mountainous region of Saxony has been followed by a remarkable development of industries using the wood of the pinus picea, the red pitch pine, the most rapidly growing and best adapted mountain pine, selected by the Saxon Government because more profitable than other species that can be cultivated in this climate and in this altitude. It has been established that 80 per cent. of the trunk of the pinus picea is available for industrial purposes alone, in addition to its use for fuel, exceeding in this respect every other needle leaf tree, and by far the deciduous species, of which the beech, for instance, only shows 20 per cent. of usefulness of its trunk for industrial purposes. The beech formerly abundant in Saxon forests, has therefore not been replanted to any extent, and the much more remunerative pinus picea now predominates all over Saxony. Even the long needle leafed

pinus picea excelsa, the German "tanne," is therefore disappearing from the Saxon forest.

In manifold uses the pinus picea ranks superior to any other tree. It is used in mine construction, for building purposes, sash, floors, shingle, roofing, barrels, boxes, matches, bottoms and covers for musical instruments, resounding boards for pianos, wooden wiring for table covers and window shades, toys, excelsior, furniture, cooperage material, poles, ladder beams, bean and hop poles, vine props, lath of all kinds, etc.

With the ascendency of wood pulp and cellulose manufacturing the usefulness of the picea was increased still more. An example of how industries follow the preservation and cultivation of forests is furnished by the fact that already in 1890 as many as 534 wood pulp factories existed in Germany; 239 of these were located in Saxony, where they consumed 575,950 cubic yards of picea wood, representing a value of $1,190,000. The beginning of this industry only dates back to 1843, when Friedrich Keller, a Saxon, invented the process.

Since 10 per cent. of the trunk of this tree is composed of bark available for tanning, it is also used for such purposes. It is easily scaled in summer, and even trees which have been felled in February and March can be thus utilized so long as the sap circulates if the trees are stripped of their branches immediately when cut down. This scaling is considered an advantage to the rapid drying of the logs, and, also in a measure a protection against the ravages of the bark beetle, scolytus, the arch enemy of the picea. Formerly the resin from this tree obtained a good price.

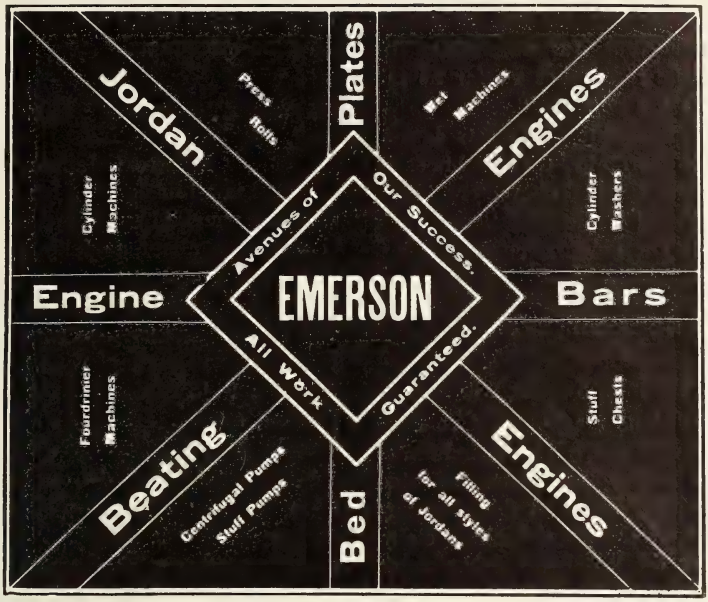
The picea's value to forestry is greatly enhanced because it flourishes where deciduous forests are greatly hampered, viz., in mountainous regions with altitudes varying from 1,500 to 4,500 feet. The Saechsische Erzgebirge, a range of mountains separating Saxony from Bohemia, and of which Eibenstock may be considered the central city, has been transformed from a region non-productive, except for small yields of rye, oats and potatoes, to one covered with pine forests of the finest growth. Saw mills, wood pulp, paper and manufacturing establishments in prosperous condition are located throughout this section. About 4,000 manufacturing establishments, employing close to 60,000 people, have been created in this State in connection with the Saxon forests.

The connection of forestry with irrigation has been studied in Germany for years. Professor Ebermeyer, for instance, has conducted extensive experiments, with the result of estimating that evaporation of soil water in forests amounts to 85 per cent. less than outside of them. While the forests do not create water springs, they feed and sustain them, in addition to the preservation of soil moisture resulting from protection against drying winds and the rays of the sun. Wherever forests are absent drought, storms and sudden floods can create conditions less frequented in well forested countries.

The climatic influences of forests have been extensively investigated in Germany. For the past forty years the Governments of Germany, Austria, and Switzerland recorded observations at their forestry meterological stations which as yet have not proven any material influence of the forest upon the climate of its surrounding territory. The only fact established by these investigations has been that the temperature of the atmosphere under the trees in summer averages from 1° to 3° Cent. (2° to 6° Fahr.) less than in the air outside of the woods. During winter time it is the same for both, while the mean for the entire year shows only 0.7° to 0.8° Cent. less for forest temperature than outside. The temperature of the forest soil was found to be from 1° to 3° Cent. lower during the entire year. The evaporation of free

(Continued on Page 42.)

EMERSON MFG. CO.



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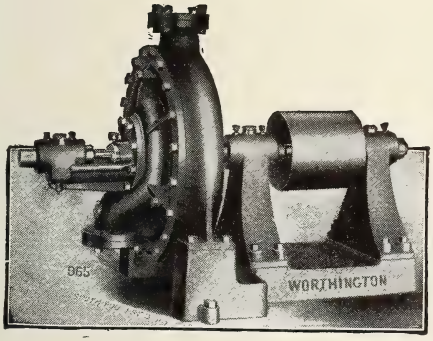

Worthington Turbine Fire Pump, working pressure 160 lbs.

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Return Tubular "McDougall" Water Tube, etc.

TANKS:
Water Tanks, Penstocks, Steel Riveted Pipe.

Hydraulic Presses:
For Pulp and Paper Mills.

Builders in Canada for "WORTHINGTON" TURBINE PUMPS, CONDENSERS, Etc. and New York Filter Co's. Pressure Filters.

(Continued from Page 40.)

water surface in the woods was calculated to be 50 to 66 per cent. less than on non-forested soil. These are the only substantial facts thus far ascertained by these scientific researches so far as climatic effects are concerned.

The hygienic value of forests is unquestioned in Germany, their richness in ozone and dust-free character being highly beneficial to health; hence their cultivation in the neighborhood of cities.

THE MARKETS.

Toronto, January 18, 1908.

Trade conditions may be said to have resumed—or very nearly so—their normal state. The money stringency affected the paper industry less probably than any other. Some of the paper-makers claim that sales for the last two months have been the greatest in their history. It is true that in some lines, such as wrappings, there has been some sagging, but this has been counterbalanced by extra business in other departments. News has kept firm. Book papers also may be said to have retained their position well. As regards pulp, there is considerable discrepancy of opinion. On the whole, ground wood is certainly little easier than it was say two months ago, fetching about $16 at the mill. At the same time the few mills which have any surplus have been asking considerably more than that. Delivered at United States mills it brings $23 or $24 to $25. Sulphite pulp brings $2.30 to $2.35. The winter has not been overfavorable in many parts of Ontario for hauling logs, owing to the scarcity of snow.

British.—Mechanical pulp is as firm as ever says World's Paper Trade Review. Quotations are £3 2s. 6d. for moist and £6 for dry. The market for sulphite is stagnant. Makers are holding firm, but buyers for 1909 are waiting to see whether these prices will hold. The chemical market is steady. Bleach is very firm at £5 5s. Ammonia alkali, 58 per cent., is quoted £4 15s.; caustic soda, 76 to 77 per cent., £11; salt cake, £2 2s.; soda crystals, £3 2s. 6d.; and recovered sulphur, £5. Blanc fixe and sulphate of alumina unchanged.

PAPER STOCK MARKET REPORTS.

Montreal, January 18, 1908.

There is a fair demand for paper stock, with not much change in prices. Quotations range about as follows:—

Unbleached cuttings	$4 50	to	$5 00
White shoe clips	4 50	to	5 00
Colored Shoe Clips	3 00	to	3 25
Domestic white rags	2 25	to	2 50
Blues and thirds	1 25	to	1 50
Roofing stock	85	to	95
Manilla rope	2 50	to	2 75
Waste papers	90	to	45
Bagging	90	to	—

SCANDINAVIAN PULP-WOOD PRICES.

Mr. Sontum, commercial agent in Norway and Sweden, in a report to the Department of Trade and Commerce, gives figures to show that the exports of wood pulp are decreasing. A considerable rise has taken place in the price of pulp logs lately, paper prices have responded to the advance, and there is some evidence of a combination on the part of makers to keep up the prices.

TRADE INQUIRIES.

The following inquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these inquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or publishers "Pulp and Paper Magazine":

News Paper.—Inquiry has been made for the names of Canadian manufacturers of paper for use in the newspaper trade by London firm acting on behalf of buyers in South Africa.

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Boils off Water, not Spent Caustic.
Is easily kept clean.
Seldom repaired, and then with ease.
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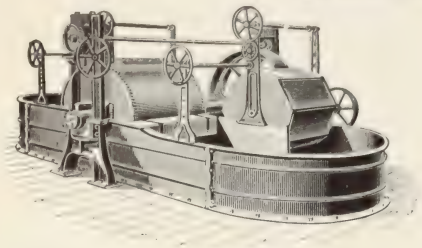
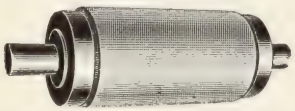


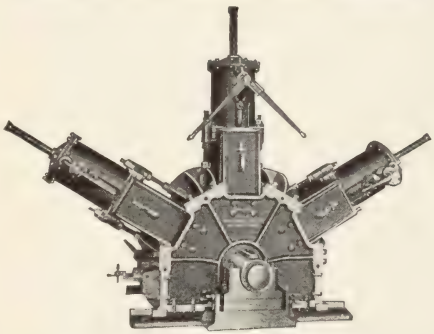
Washing and Beating Engines with Patent Double Hoist and Tubs of either wood or iron.

Hydraulic Pumps and Presses.

Rag Cutters and Rag Dusters.



Cotton and Paper Rolls with Patent Fastenings.



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Newest Designs

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Calenders. All kinds of Super-Calenders, Friction Calenders and Platers.

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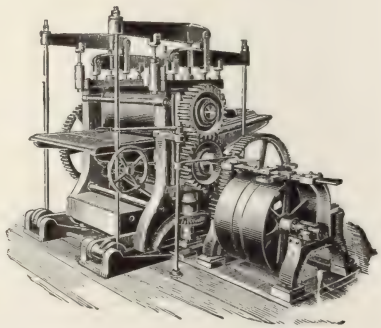

Description and Estimates Furnished; also Gear List and Catalogs sent on application.

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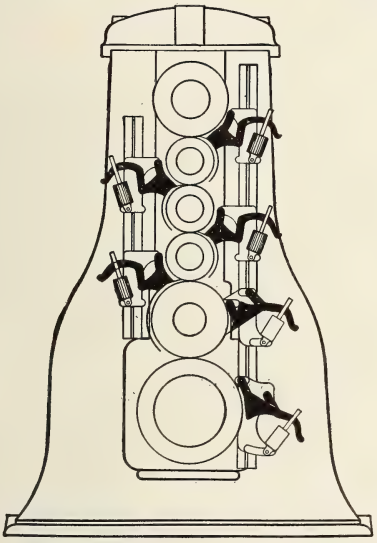

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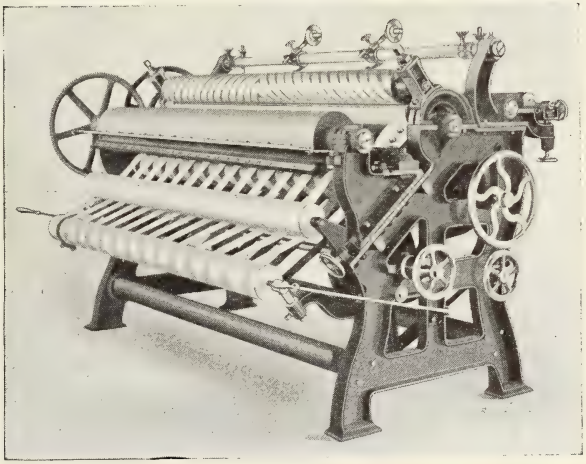

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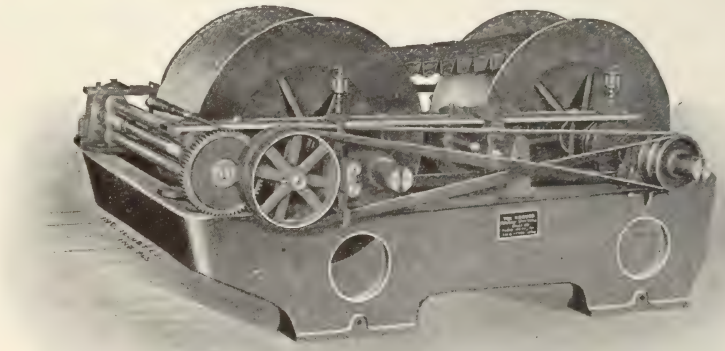

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PANZL LININGS ARE SAFEST AND MOST DURABLE

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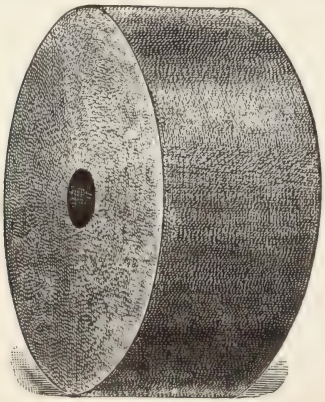

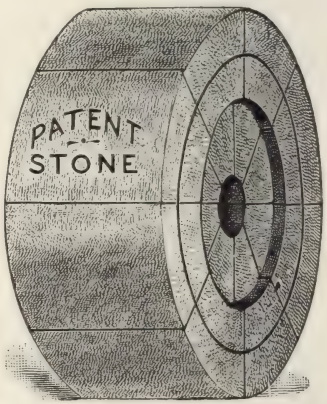

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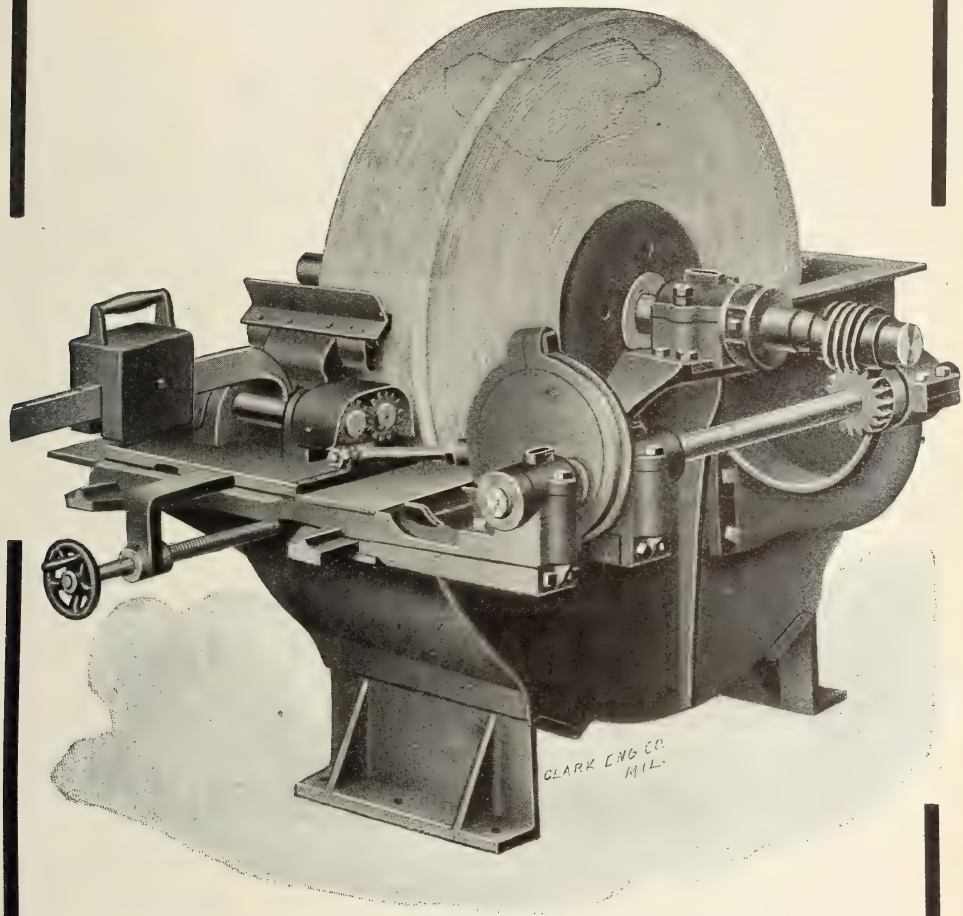

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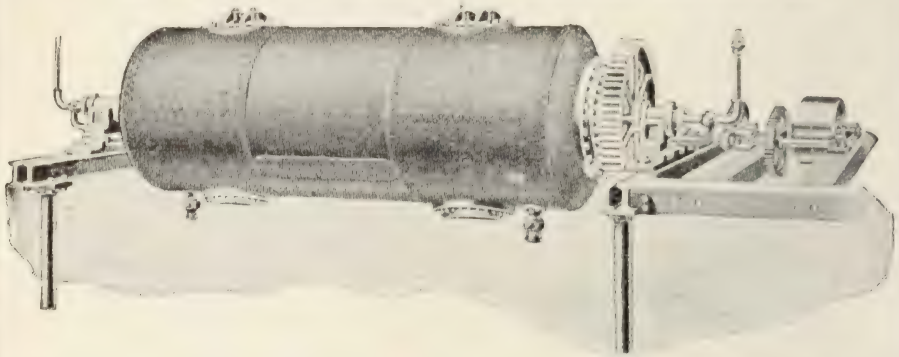

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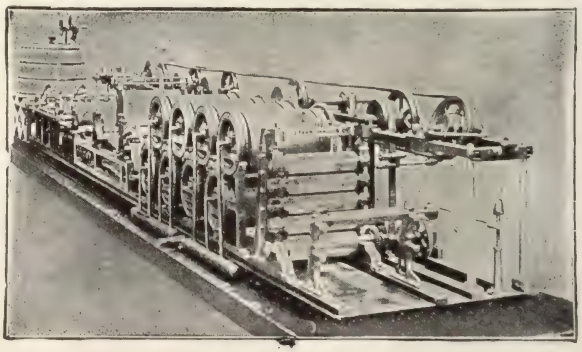

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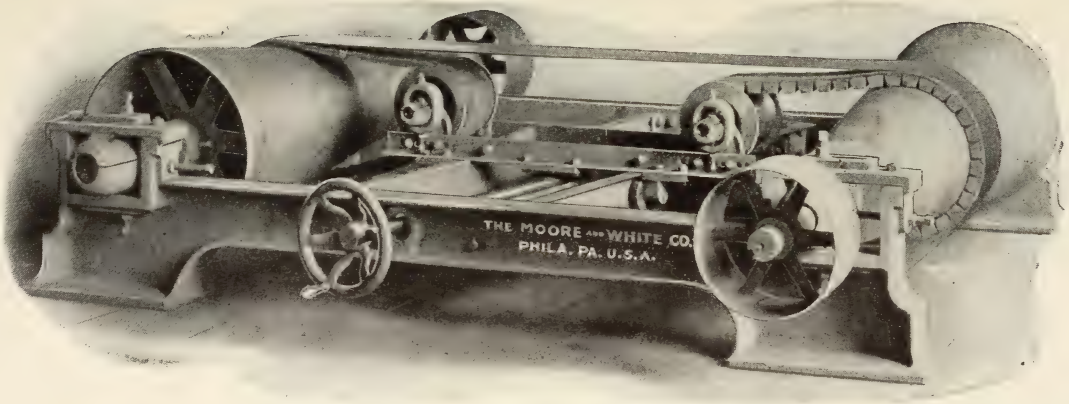

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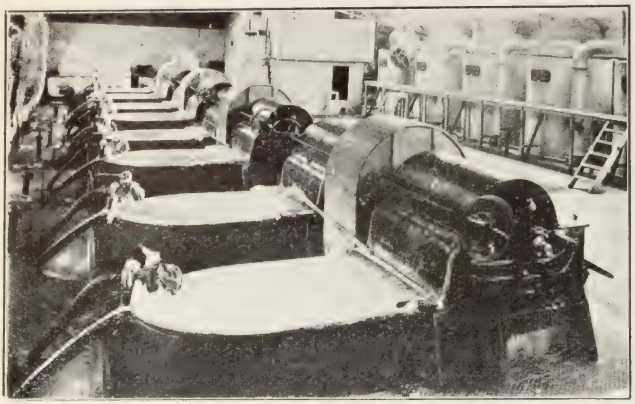

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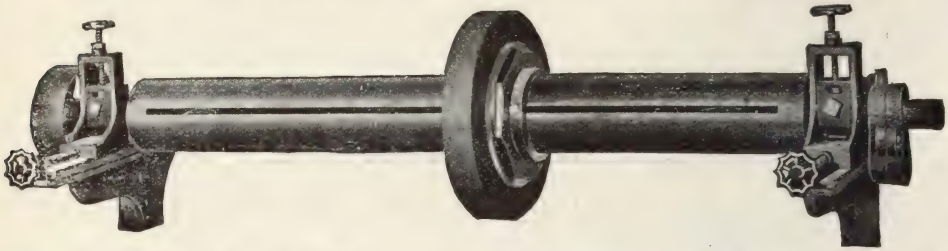

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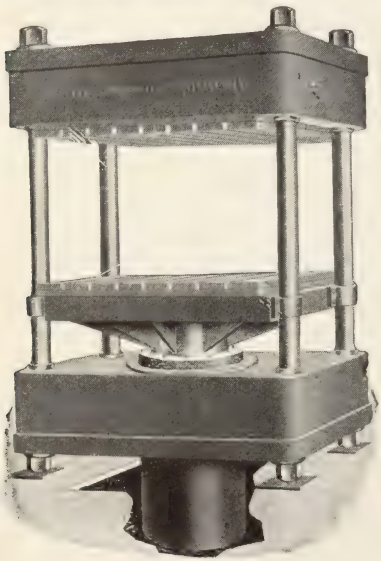

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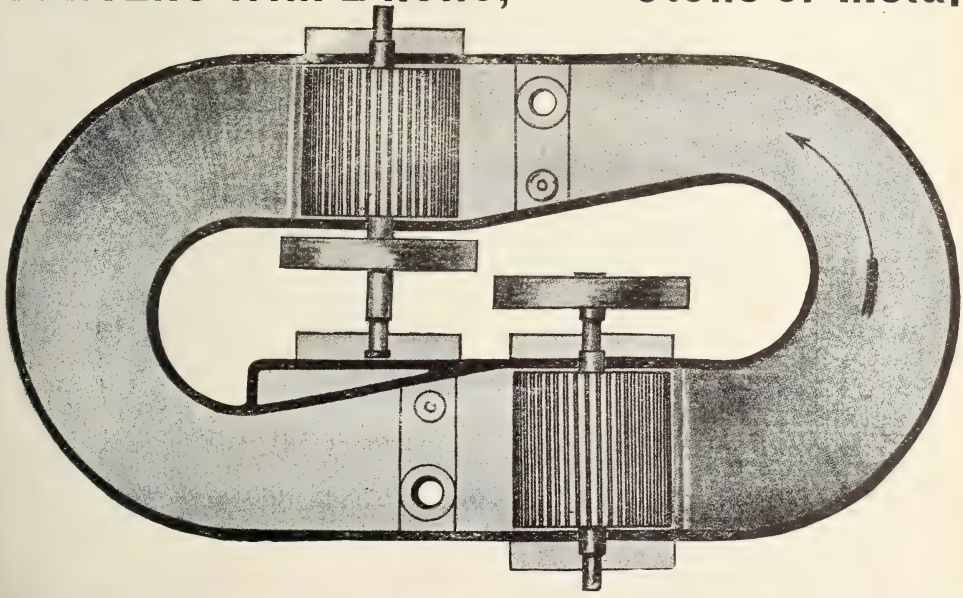

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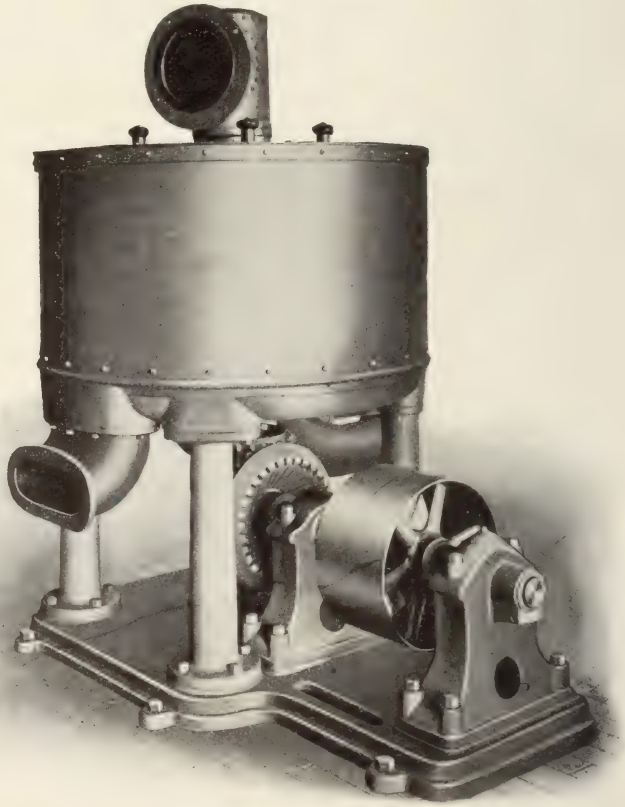

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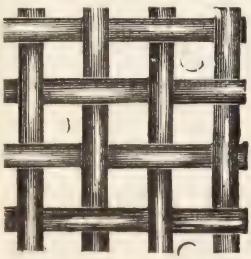

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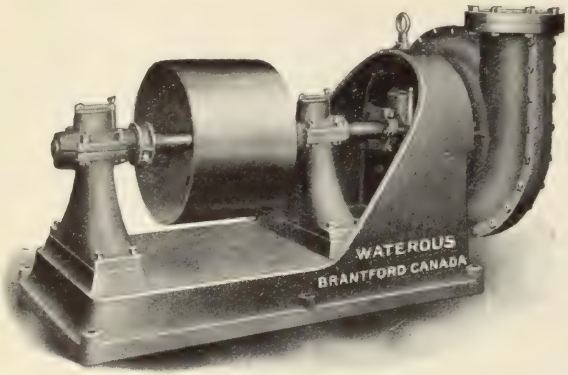

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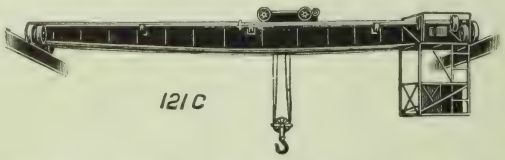

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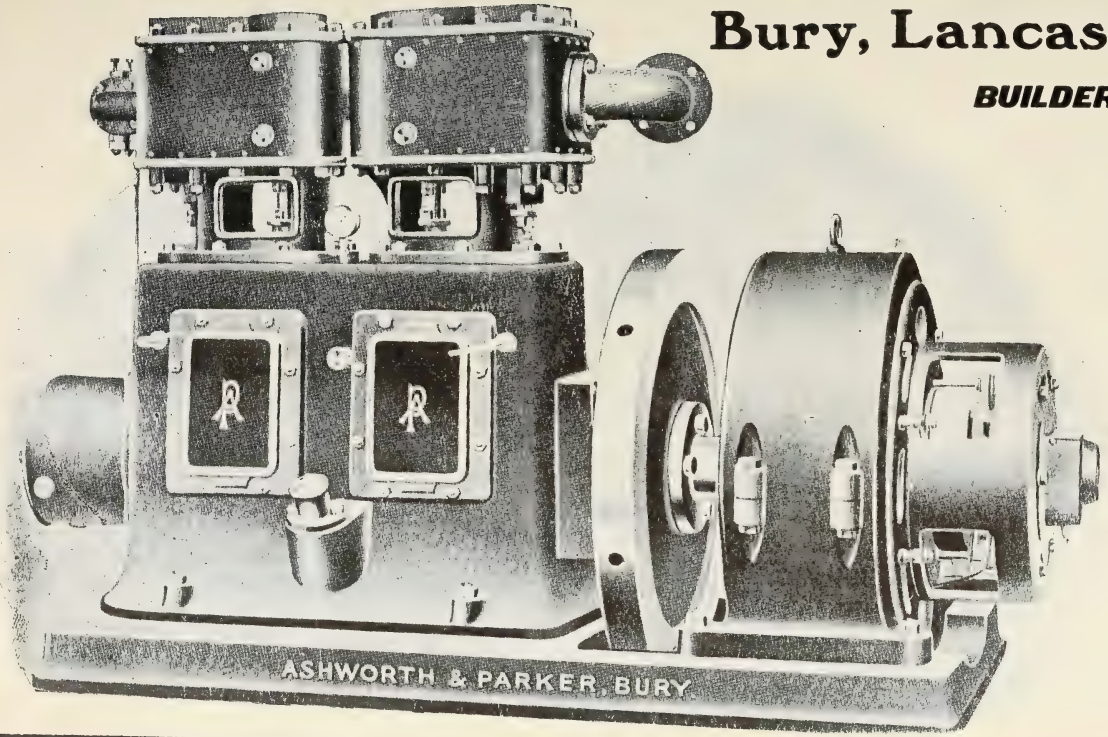

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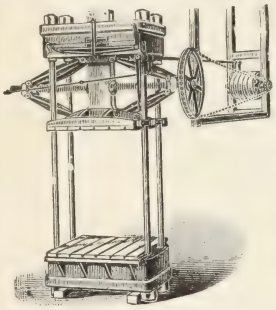

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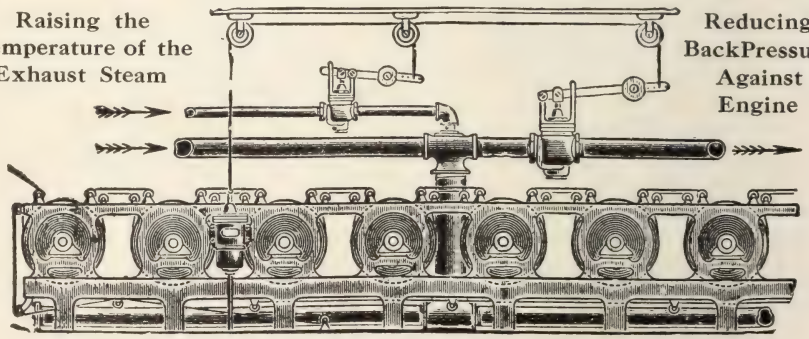

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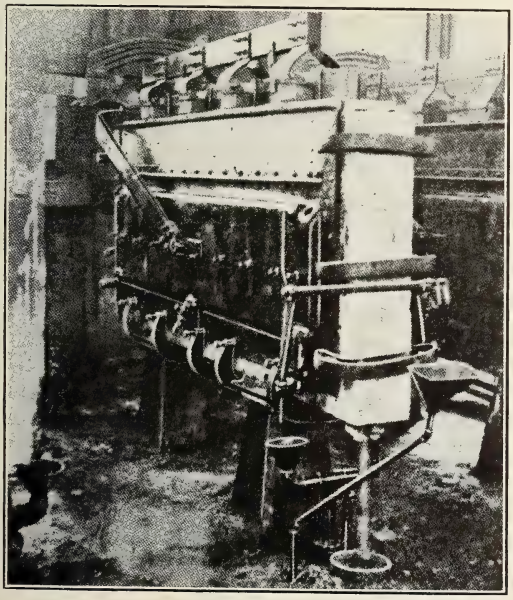

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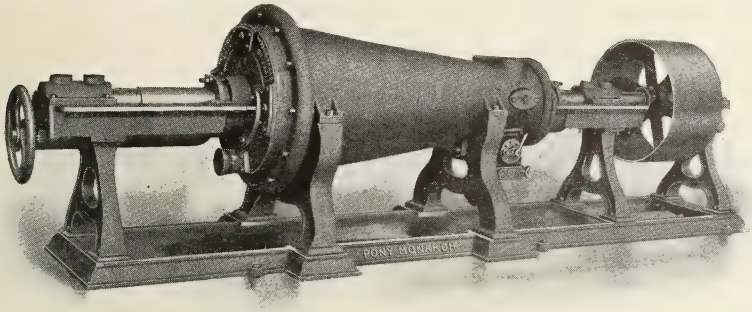

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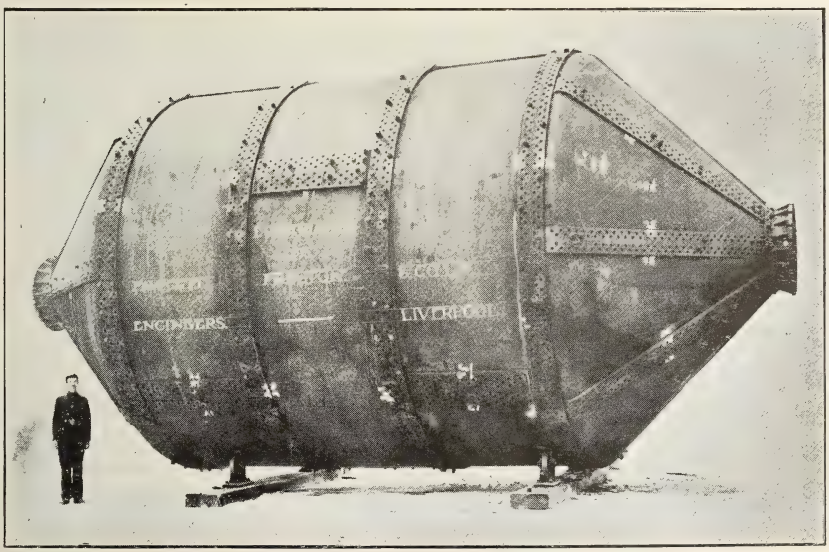

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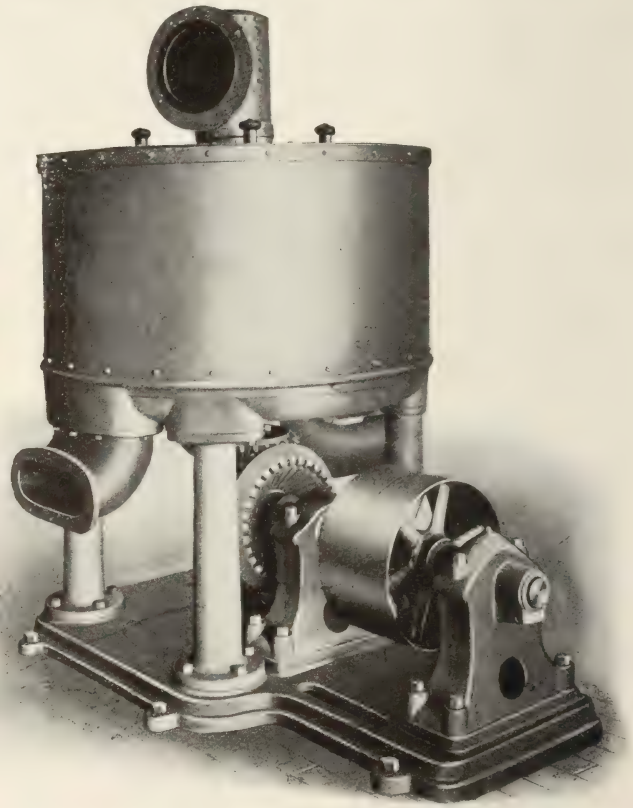

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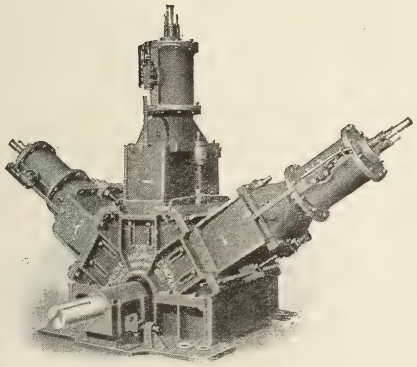

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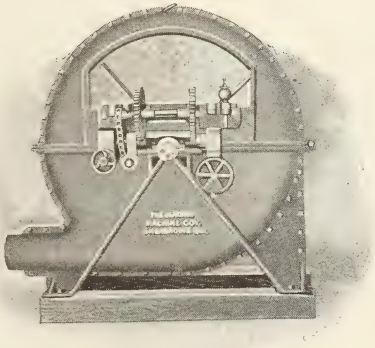

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Vol. 6.—No. 2. TORONTO, FEBRUARY, 1908. $1 a Year / Single Copy 10c

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

Subscriptions: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month, and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

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CANADIAN FORESTRY ASSOCIATION.

The Canadian Forestry Association will hold its annual meeting in Montreal on March 12th and 13th, when an extra large attendance is looked for. The Association now numbers over 2,000 members, many of them the most prominent men in the country and in the lumbering industry.

A new departure will be made at the coming meeting by allowing the papers and discussions to be conducted in either English or French, as those taking part in them may desire. The printed report which will follow the meeting will also be in both languages. It is hoped by this means to enlist the active co-operation of the people of the Province of Quebec in this national movement.

The farmer will by the discussions gain much valuable information on the management of his wood lot, which, in addition to the product in sugar, which it often yields, if properly managed, may also yield him by the annual growth, a perpetual wood supply, not only for fuel, but for other purposes as well.

All the railway companies will give free return to those buying single fare tickets to the meeting.

CANADIAN-AMERICAN POSTAL CONVENTION.

The postal convention negotiated between Canada and the United States has been in operation since May last, and it has not worked out in practice as its framers intended. From 1888 to 1907 mail matter has gone from one country to the other at the domestic rate of each. In letters and miscellaneous mail matter this was equitable, but in newspapers issuing from the office of publication, known as "second-class matter," the arrangement proved one-sided, since it was claimed by the Canadian Post Office that newspapers at half a cent a pound were carried at

a loss, and there were ten times as many United States papers entering Canada as Canadian papers entering the States. Then the character of many of those American publications was such that their circulation in Canada at all was considered detrimental to the morals of our young people, and it was thought that this class of literary matter could be displaced by more wholesome reading matter from Great Britain. To bring about this reform the British Post Office Department was persuaded to make a rate to Canada as low as the Canadian domestic rate, and thus for some months Canadian publishers have been sending their papers to Great Britain at one cent a pound, while British publishers have been mailing papers to Canada at one half-penny a pound, or one-eighth of the British domestic rate. On the other hand, Canadian and United States publishers under the new treaty have been paying four cents a pound for papers mailed across the border, and this postage had to be paid by stamps, and not in bulk as formerly. The stamp regulation was introduced on the demand of the Canadian Post Office, and was designed to hamper the circulation of American publications in Canada.

When the new convention was put into practice it was found that the high rate with the stamp attachment was a sword with two edges, for many Canadian newspapers circulated largely in the States, and the continued protests of these papers have resulted in an amendment of the postal convention with the States, just promulgated, reducing the rate on daily papers going to the States to one cent a pound, but leaving the rate on weekly and monthly publications at four cents a pound, prepaid by stamps. The newly amended treaty also provides that daily papers may come into Canada from the United States at the cent a pound rate, which is the domestic rate there, but American weekly and monthly publications now have no status at all in this class, and the only way they can obtain recognition in the Canadian mails at the cent a pound rate is to obtain registration at Ottawa, and then to ship their papers to some one of the six following points: St John, Montreal, Toronto, Winnipeg, Calgary, or Vancouver, and then mail their papers from one of these centres. This means that every American publication in this class will require to have a Canadian office or a Canadian agent. Trade and technical publications have to pay four cents a pound passing between the two countries, prepaid by stamps the same as if they were transient papers mailed by a private individual.

The lowering of the rate between Great Britain and Canada has had the effect of more than doubling the circulation of British publications in Canada, and is a good move, as showing to the British people the advantage of a low rate of newspaper postage, which publishers there do not enjoy at home. One object of the new arrangement was to encourage the cleaner British publications in Canada and discourage the undesirable literature of the United States. Unhappily this well-intentioned effort must now be admitted to be a failure, viewed from either end. For grossness and vulgarity of contents the yellow journals and magazines of the Motherland are as bad as those of the States, and the publishers of such papers have shown far more enterprise in pushing their sales in

Canada than the publishers of those enlightening papers we would like to see in our homes and libraries. And now the bars are down to the corrupting as well as the decent newspapers of the United States; while the useful publications from that country against which no immorality can be alleged are fined and harrassed in entering the Canadian field.

We cannot understand the ground of this discrimination against class journals by our Canadian Post Office Department. A trade or technical journal, for instance, contains neither fiction nor reports of crime, nor sensational reports tending to demoralize the reader; and it rarely admits to its advertising pages patent medicine advertisements or advertisements of those other nostrums whose use is connected with the darkest sin of our civilization. The sole purpose of the trade or technical journal is to advance the special industries it is born to serve, to teach men the better to handle the tools and machinery they work with, or to become more skilled in the science they are studying. It is, therefore, absolutely free from the faults which gave rise to this movement for checking the circulation of foreign papers in Canada. Many "class" papers are, in fact, wholly religious in their purpose, as, for example, Sunday School and kindred publications, yet they are penalized with an exceptionally high rate of postage, while the yellow daily, against which the convention was specially aimed, is now admitted at the most favored rate. The excuse for maintaining a discriminating rate against class journals is that it does not pay to carry them at the cheap rate. If it does not pay to carry a thousand pounds of a monthly once a month, how can it pay to carry ten thousand pounds of a daily every day? And if the Department loses money on carrying a monthly journal at a cent a pound, why does it create a free zone of forty miles for the express purpose of carrying country weeklies for nothing?

Each change in the regulations governing newspapers appears to add some fresh discrimination against one class of paper from which another is free, and the latest regulations show there is an urgent demand for some reformer who will secure fair play to all. An injustice to the class papers of Canada cannot be condoned by a still greater injustice to the American class journals, which are among the ablest of their kind in the world, and the circulation of which on this side, while not injuring any good Canadian paper, will advance every branch of science and industry to which they are devoted. If the Post Office Department thinks it is a patriotic thing to obstruct the vehicles of information upon which our industrial progress depends, it is mistaken, and is not doing a good service to a country ambitious to take a front rank in the arts and sciences.

The better policy, and the only one which will relieve the Department of continual complaints of injustice, is to fix such a rate for newspapers as will cover the cost of carriage, and then charge all alike. We believe that the Postmaster-General and his painstaking deputy have been led into these discriminations by a desire to exclude objectionable foreign publications, but such an endeavor, however praiseworthy the motive, will prove not only thankless, but futile. As the rain falls and

the sun shines upon the just and the unjust alike, we would counsel the Department to harmonize the postal policy to Nature's plan by first fixing a reasonable rate, and then giving freedom and fair play to all. If that rate is raised too high, it will defeat its own end by driving the newspapers from the post-office into the hands of the express companies, as it has done in Great Britain. The United States rate of a cent a pound is probably as near the line of safety as we can get, and if the free zone were done away with the great majority of publishers ought to be willing to pay such a rate.

GREAT BRITAIN'S PAPER TRADE.

The exports of British paper during 1907 showed a steadily increasing demand on the part of both British possessions and foreign countries. While, however, the imports amount to £5,673,815, the exports reach only £2,342,424. The movement, however, was on the right side last year, as the imports mark a decline and the exports an advance, the latter being better by £278,608, compared with 1906.

The following were the exports of British paper during the year 1907: Writings, printings and envelopes, 1,301,856 cwts., £1,612,301; hangings, 87,853 cwts., £215,697; bags, 29,834 cwts., £33,970; and other descriptions, 321,564 cwts., £482,969, compared with writings, printings, and envelopes, 1,025,009 cwts., £1,375,421; hangings, 89,514 cwts., £215,655; bags, 30,359 cwts., £33,970; and other descriptions, 282,871 cwts., £438,770 for the year 1906.

The demand last year was exceptionally good for writings, printings, and envelopes, the value representing nearly 70 per cent. of the total exports. This paper was disposed of as follows:—

	Cwts.	Value.
France	94,634	£142,838
United States	13,232	27,774
Other foreign countries	299,276	408,283
South Africa	106,209	132,857
British India	222,906	243,845
Straits Settlements	14,706	19,015
Ceylon	18,874	25,615
Australia	325,628	334,234
New Zealand	105,093	130,811
Canada	73,168	101,360
Other British possessions	28,130	45,669

The shipments of British writings and printings to foreign countries last year amounted in value to £578,895, and to British possessions, £1,033,406. Compared with 1906 foreign countries increased their cusom to the extent of £81,015, and British possessions to the extent of £155,865, the total trade being better by £236,880.

There was expansion in exports of British paper hangings, the advance on the previous year's business amounting to only £42.

There was expansion in the exports of rags and other paper-making materials from the United Kingdom last year, the total quantity being 122,909 tons of the value of £752,739, as compared with 112,957 tons, valued at £713,970 in 1906.

Bleaching materials during the year were shipped from the United Kingdom to the extent of 1,077,280 cwts., of the value of £226,696, as compared with 998,726 cwts., of the value of £209,471, for 1906.

The total imports of paper into the United Kingdom last year was £5,673,815, compared with a falling off, compared with the previous year, to the amount of £54,690. Last year was exceptional, as the supply of news from Norway, Sweden, and the United States fell off considerably. There are evidences, however, that the imports are again increasing in volume, as the value for the last month of the year, which amounted to £521,755, shows an increase of £46,677, compared with the corresponding month of the previous year.

These imports were as follows:—

	Cwt.	Value.
Unprinted, on reels	1,696,283	£1,018,629
Unprinted, not on reels	3,664,444	2,899,325
Hangings	61,162	167,990
Other printed or coated papers	168,715	453,303
Strawboard	2,202,243	622,724
Mill or wood pulp boards	1,085,377	511,844

The value of unprinted paper received at British ports last year was £3,917,954, or nearly 70 per cent. of the total value. The countries supplying unprinted paper on reels and not on reels were as under:—

Unprinted, on Reels.

	Cwt.	Value.
Sweden	564,600	£329,391
Norway	482,057	284,127
United States	294,033	158,603
Germany	104,424	74,577
Netherlands	89,508	64,729
Belgium	14,089	13,098
Other countries	147,572	94,104

Unprinted, Not on Reels.

	Cwt.	Value.
Sweden	1,059,361	£708,844
Norway	948,916	599,034
Netherlands	499,106	482,845
Germany	378,131	342,904
Belgium	295,151	273,988
United States	82,475	93,958
Other countries	401,304	397,752

Last year's supplies of reel paper show a drop in value of £206,911, compared with the previous year. The principal loss was sustained by the United States, whose shipments showed a decrease of £91,958. Norway sent £78,063 worth less of reel paper, while the receipts from Sweden show a decline of £57,841.

The imports of unprinted paper not on reels show an increase in value of £128,016 last year, as compared with 1906. Sweden, which holds the premier position, increased her business to the extent of £81,865, and Norway to the amount of £19,479. The shipments from the Netherlands mark an increase of £38,756, and from Germany an advance of £7,286. Belgium, on the other hand, shows a decrease of £1,760. Again, a heavy reduction is shown in the value of the arrivals from the United States, the loss amounting to £29,512.

There was an increased tonnage of paper-making materials imported, serving to indicate an expansion in paper production. The total value stands at £4,363,295, an advance of £427,886 compared with 1906. This increase, to some extent, is due to the higher cost of raw materials, but the quantity of wood pulp, etc., was also larger. The various materials imported during the year were as under:—

Wood pulp

	Tons.	Value.
Chemical dry ..	270,941	£2,308,748
Chemical wet ..	22,314	88,108
Mechanical dry.	6,269	30,024
Mechanical wet.	372,975	885,467
Esparto	202,523	738,834
Rags	20,039	206,151
All other	....	105,963

There was an increase last year, compared with 1906, of 30,292 tons dry and 5,944 tons wet chemical wood pulp, with respective increases in value of £252,920 and £21,867. The imports of dry mechanical show a decrease of 400 tons, but an increase in value of £1,259, and wet mechanical increases of 29,852 tons and £121,092. There was an increased importation of esparto of 14,331 tons and £61,779. Rags show a decreased importation of 2,207 tons and £10,509, and other articles a decrease in value of £20,522.

NOVA SCOTIA'S PULPWOOD.

The maritime Province of Nova Scotia is not generally looked on as a banner pulpwood Province of the Dominion. All the more, therefore, is the pre-eminence of Canada's position as a producer of this prime necessary to the great paper-making industry indicated, when one glances at some estimates made recently as to the possible production of the territory adjacent to the Atlantic seaboard. Here both soil and climate are peculiarly favorable to a rapid and luxuriant growth of spruce. Six tracts were carefully cruised, amounting in area to about 1,200 square miles. These several tracts in the aggregate are estimated on a conservative basis to be capable of cutting 28,000,000 cords of pulpwood. Allowing for burnt-over areas on granted as well as ungranted lands, and calculating on a growth of from 5 to 8 inches within, say, twelve years, it is calculated that the Province could supply over two millions and a quarter of cords per annum for all time, providing no great fires are allowed to sweep over the areas. The present annual demand for mills existing in the Province is only about 22,500 cords. Supplies of pulpwood can be obtained to some extent from nearly every county, but those in which it is chiefly cut at present are Queen's, Shelburne, Digby, and Hants; also in Cape Breton for export.

A movement is gaining force every year to protect Nova Scotia's forest wealth more adequately than has been the case in the past. The sources of the rivers particularly need more careful protection from denudation, so as to prevent alternate droughts and freshets.

WHAT THE AMERICANS THINK.

If there are gentlemen on this floor who wish to see that industry wiped out, who wish to throw out of employment tens of thousands of American wage earners and have them walking and moaning on the streets; if they wish to see the smoke and fires extinguished of the 108 mills now in the State of New York and the mills of the West, and the industry hampered so that it no longer becomes a factor in the commercial development of the country, then it is only necessary to wipe out the tariff on pulp and paper and give to Canada the power to pass prohibitive export laws and close all the mills of the United States.—J. Tirrell, in the Washington House of Representatives.

PULP AND PAPER NEWS.

The Copp, Clark Company, Limited, has been authorized to increase its capital stock from $200,000 to $300,000.

* * *

The Imperial Paper Box Company inform us that they have no intention of leaving Toronto, as intimated in last issue.

* * *

Considerable pulp-wood is being removed from the right of way between Shawville and Campbell's Bay this winter.

* * *

The Bayard Timber Company, Limited, Vancouver, has received a charter to manufacture bolts, etc., and carry on business as pulp mill owners and lumbermen.

* * *

A few days ago there was a fire in the Thomson Paper Company's premises, Toronto, which did $4,000 damage. The Horace Tomkins Printing Company's place was also damaged.

* * *

The Chaudiere Basin Power Company, Limited, Montreal, capital $50,000, has been chartered to buy and deal in pulpwood and lumber. F.H. Manley and J. F. McKenzie, of Montreal, are members.

* * *

The Ottawa Gas Company together with some American capitalists are interested in a project to establish a factory in that city for the manufacture of roofing and other tarred paper.

* * *

The Kelley Bros.-Mitchell Company, of Vancouver, have installed a 15-ton Northern Traveling Crane, 40-ft. span, equipped with alternating current motors. The crane was furnished by the Northern Engineering Works, of Detroit, Mich.

* * *

We regret to learn of the death of R. R. Sweezey, the agent in Quebec City of the Watertown Pulp-wood Supply Company, of which further particulars will be found in another column. He was only 53 years of age, and had been ill for some time. He leaves a widow and family.

* * *

The George M. Hendry Company, Ltd., Toronto, capital stock, $140,000, have been incorporated to publish, purchase, manufacture and sell stationery and school supplies. G. M. Hendry, 127 Balmoral Avenue, Toronto, and F. G. McKay, 150 Cottingham Street, Toronto, are provisional directors.

* * *

The Benallack Lithographing & Printing Company, Limited, Montreal, capital $400,000, has been incorporated. It will manufacture paper and cardboard and carry on a publishing, printing and engraving business. W. J. Benallack and A. D. Anderson, of Westmount, Que., are charter members.

* *

In the case of Sprague, assignee of Seward Webb, of New York, v. J. R. Booth, Ottawa, to recover $250,000 deposit paid in connection with the purchase of the Canada Atlantic Railway, the courts have declared such deposit to be forfeited through non-fulfilment of the agreement.

* * *

The quantity of spruce deals exported from St. John, N. B., during 1907 was almost 20,000,000 feet greater than in 1906, and more than 48,000,000 feet in excess of that for 1905. Last year all the logs cut on the St. John River were brought out, along with all that were hung up from the previous year, and enough logs are still held over at St. John to run the mills for a large part of next summer.

* * *

A peculiar tragedy is reported from Queenston, Ireland, a dispatch stating the barque Germanic, of Weymouth, N.S., had foundered in mid-Atlantic. The captain had been killed by a falling spar at the moment when the Germanic sank. The remaining seven of the crew in the second boat are believed to have been

lost. The foundering was caused by the cargo of wood pulp, which became flooded during heavy weather and swelled, bursting the decks and opening the seams.

* * *

The United States Customs Board of General Appraisers has overruled a number of protests brought by W. H. Allison, of Detroit, against the assessment on an importation of wood pulp of a countervailing duty of 25 cents per cord of pulpwood used in the manufacture of pulp, in addition to the regular duty provided in the tariff. The greater part of the merchandise was exported by the Thorold Pulp Company, Limited, and the Riordon Paper Mills, Limited.

* * *

The A. R. Williams Machinery Company, Limited, has submitted to Peterboro' Council, a proposition for the reorganization of the Wm. Hamilton Manufacturing Company, Limited. It includes a loan of $50,000, without interest except under certain conditions; a fixed assessment for ten years; the employment by the company of at least 150 employees during nine months of the year; an expenditure by it of at least $30,000 in new buildings, plant, and machinery, within five years.

* * *

Negotiations are under way for the taking over of a controlling interest in the Menzie Wall Paper Company, Toronto, by Watson, Foster & Company, Montreal, and the reorganization of the whole business under the name of the Reg. N. Boxer Company, Limited, with a capital of $250,000. R. N. Boxer will be president and general manager, and F. M. Hulbig, secretary-treasurer. The head offices will likely be in Toronto. Arthur Munro, who has been manager of the Menzie Company for a long time is severing his connection. Most of the old employees will be retained.

* * *

In the matter of the application of the Riordon Paper Mills, Limited, under section 323 of the Railway Act, for an order directing the G.T.R. to issue a supplement to its tariff, making the rate on roofing paper, unfinished carloads, Merritton to Montreal, 17½c. per 100 pounds, the Railroad Commission ordered that the G.T.R. shall change its said tariff so that the tolls to be charged upon the class of paper covered by that tariff, for carriage from Merritton, St. Catharines, or Thorold, to Montreal, shall not be greater than the rates charged under such tariff for carriage from Brantford to Montreal, and that in any future change of tariffs upon such paper, the rates for carriage from Merritton, St. Catharines and Thorold to Montreal, shall not be greater than those to be charged from Brantford to Montreal. * * *

Two important railway lines are now under construction in New Brunswick. One of these, the International, will extend through New Brunswick from Campbellton to St. Leonards. At the latter point it will connect with the Bangor and Aroostook, the G. T. Pacific and the Canadian Pacific. At Campbellton it will connect with the Intercolonial, which cuts across into Quebec, and with the Atlantic, Quebec and Western. This latter is the second new line, and it is expected to develop local traffic along the Gaspe coast as well as contributing to through traffic. When these are completed it will open up a large territory surrounding the Baie des Chaleurs, and the Restigouche River, which is rich in pulp-wood. Several new pulp and paper mills are said to be projected for this district.

* * *

The Canadian Gazette of London, a paper prominent among those published in England devoting themselves to Canadian affairs had an article in a recent number upon the situation of the Imperial Paper Mills. In this it traced in reported offers on behalf of American paper manufacturers to purchase the mills, another significant step in their recent troubled history of litigation and counter litigation, whereby they hope to obtain control of a highly valuable property. It added: "With the present mills so far complete for their present production and the present scale of prices

obtainable in the markets, higher than ever before in the history of the company and likely long to continue and to increase there is every prospect of the reorganized company proving one of the great commercial successes of Canada."

NEWS OF THE MILLS.

We hear that the Canada Paper Company's plant at Windsor Mills, P.Q., has closed down temporarily.

* * *

The Lincoln Paper Mills Company, St. Catharines, Ont., has given all its employees the usual dividend of 6 per cent. on their annual earnings.

* * *

The Brompton Pulp and Paper Company's mill at Bromptonville, Que., was closed down a few days last week, some damage having been caused to their power plant by ice.

* * *

Booth's pulp mill at Ottawa has been interfered with lately by anchor ice in the Chaudiere. It is turning out more pulp however than this time last year, when low water greatly retarded operations.

* * *

Booth's new sulphite mill in Ottawa is expected to be in operation by June 1st, when 60 or 70 men additional will be employed, increasing the consumption of pulp-wood from 80 to 200 cords per day.

* * *

J. E. Vallillee, formerly manager for the James Maclaren Company, Limited, manufacturers of ground wood pulp, etc., Buckingham, Que., and who acted as sales agent last year, has severed his connection with that company. In future all sales will be made through the head office at Buckingham.

* * *

At the Lincoln Paper Mills, Merritton, Ont., a week or so ago a fund was raised for the relief of the poor, the original intention being to send it to Toronto; but wisely the committee having charge of the fund thought it best to first assist any deserving poor in the village.

It is expected that the old Taylor Paper Mills, in the Don Valley, Toronto, recently purchased by Robert Davies, and which are now being fitted up with machinery, will be ready for operation in three months, with 100 men in operation. The Canadian Northern is running a spur line into the property.

* * *

Further reports to hand state that the New York Times is endeavoring to interest other newspaper companies with a view to purchasing the Imperial Paper Mills at Sturgeon Falls, Ont., and producing paper at cost. Negotiations to this end, however, it is stated, would be contingent on the United States duty on pulp and paper being removed.

* * *

Among the powers granted by a recent Quebec charter to the St. Lawrence Lumber Industrial Company is that to manufacture and sell pulp and paper in the counties of Saguenay and Chicoutimi, Que. The capital is $300,000, and among those interested are: B. C. Howard and Robert E. Ewing, of Sherbrooke, Que.

* * *

The British Canadian Wood Pulp and Paper Company expects to have a plant ready at Howe Sound, B.C., for turning out 35 to 40 tons of wrapping paper per week, within three months, having altered its original plan of completing its pulp mill first. We understand that a large amount of the company's 7 per cent. preferred stock has already been disposed of.

—Maxwell Holm & Company, pulp agents and importers, 181 Queen Victoria Street, London (Eng.), E.C., have dissolved partnership, Mr. Maxwell retiring, and Alfred A. Holm has formed a company to carry on the business of which he will be managing director.

ECONOMIC REFORESTATION.*

Prof. B. E. Fernow, Dean of the Faculty of Forestry, Toronto University, delivered recently before the Canadian Manufacturers' Association in Toronto his first public address on the above subject; and it is not too much to say that by his masterly handling of this, perhaps the greatest and most important problem before the Canadian people to-day, he engrossed the attention of the manufacturers in this direction in a way that has never been equalled.

Prof. Fernow at the start took exception to the title of his address as named by the secretary, viz., "Reforestation." This, as the Professor remarked, presupposes de-foresting, which implies that the forester's work begins when the country is already devastated of its forests. The fact is, the work of the forester begins, or should begin, when the first tree is cut.

On the 12,000,000 acres of German State forests, which are managed for continuity of wood supplies, the expenditure for planting is less than 18 cents per acre per year, or less than 5 per cent. of the total expense, and that in Prussia of the cost of producing one cubic foot of wood, namely, 2 cents, only one-third of a cent goes to planting, you will realize that in a well-managed forest property the planting cost is a relatively small item.

There are, to be sure, large areas in Canada where deforestation has progressed to an undesirable, if not dangerous degree, and where it is not only desirable, but practicable and profitable to begin the work of artificial reforestation of these denuded areas. The southern sections of Ontario, rich in agricultural lands, are almost entirely cleared of timber growth. Here a farm area of 5,000,000 acres can be found containing less than 10 per cent., or 500,000 acres, of woodland, and there is altogether probably 50 per cent. of waste land on these farms that could be more profitably employed for wood crops than for farm crops. During the recent strike in the anthracite coal regions of the States, this section actually suffered from a fuel famine, because the farmers' wood lots were too scanty to supply domestic needs. In this section, indeed, reforesting by private land owners has been begun, stimulated by wise Government aid with nursery trees and advice. This planting of farmers' wood lots can, however, for practical and technical reasons, only accomplish three things, namely, furnish local domestic supplies, improve conditions of the farm, and make waste lands useful producers.

But the much larger portion of Ontario, and of all the other Provinces in the East, is still in the woods, and the much more important question is as to the condition, present use, and future value and use of this portion.

Canada has the reputation of having been and still being a great forest country, and one of the most prominent wood exporters of the world. It is claimed by some that 800,000,000 acres, or over 37 per cent., of the land area is under wood. But if we look at this vast forest area from the manufacturer's point of view, from the standpoint of supplies for the arts and industries—of its commercial value, and study merely the geography and nature of the country in the light of the reports on the more or less explored outlying

* The estimate of R. H. Campbell, chief of the Forestry Department of the Dominion Government, on the other hand, is that Canada possesses 535,000,000 acres of valuable forest land. Even this, however, is far less than the 800,000,000 acres, originally supposed to represent Canada's resources.

parts of the same, we will come to the conclusion that 300,000,000 acres, and, perhaps, less, will cover fully the commercially valuable timberland area, actual and potential, or not much more than one-half of the commercial forest area of the United States. Relatively, then, Canada is a poorly wooded country.

This may sound curious to those of you who are located in the vast forest region of Quebec, or Ontario, or New Brunswick, or British Columbia, but these are the smaller portions of your great country, and the vast prairie and plains area, which is not at all or only scantily wooded, and is now beginning to be developed rapidly, must also be taken into consideration. Moreover, at least one-fifth of this area is on the Pacific side of the continent.

Area, however, does not mean much except possibilities. Contents in the virgin woods are extremely variable, and the more difficult yet more important question is how much available log material this commercial timber area can furnish. Large statistical figures appear to the layman a convincing argument of plenty, but the only way of understanding their meaning is to place them in relation with other figures. I suppose, however, the Statistician of the Dominion had good basis for stating as long as twelve years ago that, "the first quality pine has nearly disappeared," and that we are within reasonable distance of the time when, with the exception of spruce as to wood and of British Columbia as to Provinces, Canada shall cease to be a wood exporting country. If the estimates of that authority were anywhere near correct the amount of white pine remaining would now be less than twenty billion feet, not enough to supply the present demand for, say, another decade, and that relatively small balance is mostly confined to Ontario.

The larger portion of the commercial forest area of Eastern Canada is cut over and culled of its best timber.

The major part of the culled area, and especially the pineries, is burnt over, the natural reproduction being mainly of inferior kinds.

The supply of spruce for paper manufacture remains relatively the largest item in the commercial timber supply.

Little or nothing is done to protect or encourage the production of future supplies.

The census of 1891 made the total forest production of Canada $80,000,000 ($16 per capita), the cut being figured at 1,400,000,000 cubic feet for home consumption, and 600,000,000 for the export, or altogether over 2,000,000,000 feet, say, 400 cubic feet per capita, a figure not very different from the per capita consumption in the States, but twenty times that of Great Britain.

If we apply the same rate of consumption to our present population, which is probably not much below 6,000,000, we can safely place our present wood consumption at around 2,400,000,000 cubic feet of actual material, which, with existing standards and wastefulness of logging, represents not less than 3,000,000,000 cubic feet of wood as it grows in the forest. That is the annual growth of not less than 50,000,000 acres under good management, and of three to six times as many if left to mere natural growth. I bring forward these crude and not altogether reliable figures to make you realize the fact that it is time to change the attitude toward the treatment of your timber resources, and that those who supinely laugh at the efforts of the forestry propagandists are either ill-informed or unpatriotic.

The difficulty of reforestation does not lie in the technical, but in the economic direction. The question is not, "Can the white pine be reproduced, and how?" but, "Can I afford to do the things which are necessary to reproduce it?" As far as private forest owners are concerned, it is purely and absolutely a financial question as to whether it pays better to practice destructive lumbering or conservative lumbering,

which is the beginning of practising forestry.

The answer to this question is, of course, a matter of calculation, as in every other business; the same factors which enter into profit calculations in other businesses enter here. There is only one factor that is essentially different and characteristic in the forestry business, the time element. In this it differs from every other business except life insurance. The manufacturer deals with months, and possibly a year or two which elapse between the receipt of the order and the delivery of the goods, the farmer reaps annually, and the fruit-grower within ten years from starting the orchard. But to grow a log of useful size takes from sixty to 120 years. Most of the trees which the lumberman cuts to-day are over 150 years from the seeding time, and, while the forester can to some extent hasten the processes of nature, he will only rarely bring acres of forest growth to utilizable size for lumber in less than two generations.

Nobody who has studied the history of the world as regards wood consumption, and who has realized the reason for the extensive use of this most useful material, will doubt that, as long as civilization lasts, wood in some form will be a desirable and much-sought material, that cannot be displaced entirely by any substitutes; but, of course, the character and form and amount of its use may greatly vary.

We see that the time element in forestry is a speculative element which may all but ruin an otherwise legitimate business.

The time element, naturally, renders the financial calculations somewhat hazardous. What price will rule when our crop comes to market? What interest rate shall we figure on the long time investment? What expenditures can we afford now with the assurance of profitable returns? These are all questions of a speculative character. Forestry really is dealing in futures!

We may have no doubt that wood prices will increase, as they have increased in the past; indeed, for a time at least, at a greater rate than in the past, for within the last decade not only has the per capita consumption of wood among all civilized nations increased at a rate of about 3 to 5 per cent. compound per annum, but all the exporting nations have waked up to the realization that their forest resources are not, as they had supposed, inexhaustible, but are, indeed, measurably near the time of exhaustion, and have begun to appreciate their value, and have placed bars on their exportation, or otherwise limited the cut.

Wood prices in Prussia for sixty-five years prior to 1895 experienced a rise of 1½ per cent. per annum. They doubled in the next thirty-five years, and rose 50 per cent. in the next thirty years. Since the fifteen years from 1890 to 1905, the rate of increase has been nearer 2½ per cent., namely, from 4.4 to 6.8 cents per cubic foot.

In Canada, from 1850 to 1894, the average annual rise has been not less than 5 per cent. You know how much more rapidly it has risen since.

In the United States the rise has been for some time at 2½ to 3 per cent., and in 1900 precisely the timber famine began, if sudden high prices denote dearth.

There is no doubt that wood prices will rise, and that quickly, but where is the limit, the definite figure which we may use in a calculation made to justify a present expenditure?

There is now—and has been in progress for some time—among foresters a battle royal as to the proper way of figuring the financial results of forest management, but no agreement has been reached, and even the necessity of such calculations, for the Governments at least, is not admitted by many. Meanwhile the Governments and the supervised corporations and private owners reap the benefit of their persistent, conservative policy and of their improvements in the forests and in the forest service in the shape of

continuously increasing revenues—true revenues, not derived at the expense of capital, without decrease, nay, with rather added value to the investment and increased per acre production.

The maturity of timber, the ripeness for the axe, is not a matter of natural period, but of calculation and consideration of its marketableness. The year's growth cannot be harvested or marketed; it requires an accumulation of annual growths before a tree becomes useful. When posts, at 30 to 40, besides fuel, there may be telegraph poles and railroad ties; at 60 to 80 years, small log timber will have developed, and then this will increase in proportion constantly for the next 100 to 200 years, quantity, as well as quality improving. Now, this method of accumulating the harvest and being able to cut it at various times at our choice brings with it, just like a life insurance, a continuous locking up of capital and interest, which only a capitalist, a man of means or a strong corporation, can stand. Thus, a 100-year-old stand of pine has not only locked up the soil and whatever initial investment was placed on it in the way of planting or otherwise, but it has also locked up the interest, a 100 years of growth, accumulating, say, 6,000 cubic feet of wood per acre, worth, say, $200 at least.

In order to turn wood crop production into an annual business, it would be necessary to have one stand become ripe or 100 years old every year, so that we may have a regular annual harvest —that means 100 such stands differing by a year in age. The capital involved in such a series of 100 age classes, as it is termed, would figure up, according to different soils and species from 400,000 to 1,500,000 cubic feet, and probably not less than $8,000 for the 100 acres. To make a living from forest growing as a business, you can really see that not less than fifty such series, worth not less than $400,000 in the wood capital alone, would have to be kept up to insure an annual income of $10,000.

These calculations are, to be sure, only schematic, and would fall out more favorably here and there, but they give you an insight into the character of the financial aspect of forestry. It is a business for large capital with long time investments.

The possibility of harvesting earlier, of lowering the rotation—as the length of time is called to which the crop is allowed to grow—is a constant temptation to do so, and, as a matter of fact, we find that in France, where private ownership prevails, the rotation has been constantly reduced, until now little more than firewood is grown on the larger portion of the forest area, and the bulk of sizeable material has to be imported.

The proposition of a change of methods from the current ones does not necessarily imply a criticism of the latter. The methods as they exist are of historical growth, and were devised for pioneering conditions and with a different purpose in view, namely, to secure income and to open the country for settlement, and for these ends they probably were the best that could be devised. But the time is here, if I am not mistaken, or rapidly approaching, when it will be wisdom to change these methods, when a new purpose is to be substituted, when not merely present profitable exploitations, but the future needs are to be considered, and hence new methods are in order.

Some one has, with cogent logic, shown that the present method of disposing of timber limits under the triple charge of ground rent, bonus and stumpage dues discourages the application of conservative logging methods on the part of the timber limit holder.

But I go further and maintain that the timber limit holder cannot, under any system of lease, be expected voluntarily to introduce forestry methods. It is the Government that must take the risk and stand the cost which new prescribed conditions of logging involve, and enforce such conditions.

Fortunately, in the Dominion the

Government does own the basis of forest production, the land itself and the virgin as well as the cut-over forest —at least, the bulk of it. Can there be two opinions as to whether it should manage this property as a permanent investment, or merely exploit it for what is in it, placed there by nature?

A rational policy requires that a distinction be made between the lands that are only fit for timber growing and those which are more advantageously turned to farm use. There will then appear some land to be doubtful as to its classification, but that should be also left to timber growing, until good reasons appear for settling it; i.e., until the time has arrived when second class farm lands have become profitable and are needed.

Fortunately, timber will grow, though less rapidly, on the poorer soils, which lack in fertility or are physically difficult to farm, and hence there should be no quarrel between farmer and forester.

On such areas set aside for forest growing—forest reservations—the Government should dispose of the timber systematically in such manner as to make sure of a future crop, i.e., practise forestry.

This requirement is bound to bring the Government to a double dilemma, an economic and a political one, namely, how far to consider the present and how far the future, but sooner or later, if the necessity of forestry is once admitted, it will have to choose the one form which points to the future.

Hitherto, the Government has desired to secure an income from the timber before the land was to be settled, or else has made the timber a source of income without the settlement in view. I do not use the word revenue, which implies a continuous income. Indeed, the policy proposed of introducing forestry methods means change of the temporary and limitable income into a continuous revenue forever. Every one of you is financier enough to see, even if you do not realize the exact method, that that cannot be done without some expenditure or without curtailing present income.

This is the economic dilemma: The Government must be willing to forego or spend part of the present income in order to insure a continuous future revenue. I understand it can well afford to do so.

The political dilemma is, how to deal with the timber limit holders, and this, I dare say, is the more troublesome.

I know enough about the situation to recognize, first, that this is a complicated problem; and secondly, that I dare not even suggest the simple solution which the mere student of political economy and statecraft would readily propose, namely, to cut the Gordian knot and make an all round new and square deal.

There are, if I understand the situation correctly, three classes of limit holders (which may, of course, all three, be found in the same person), namely, the limit holders of long ago, those of recent origin under changed conditions of lease, and those of the future. I also understand that, although the Government in the leases granted to the first two classes has reserved the right to change conditions of lease, usage has made this condition nugatory.

There are many objectionable features in these leases, but the worst feature of these earlier leases is that practically they do not terminate, and hence the much-praised ownership by the Government is a delusion, and the Government is apparently debarred from using its property, or having it used to the best advantage. It would appear that as long as any young growth of pine which may grow into timber exists on a limit, this is vested in the limit holder.

Unless, then the Government can assert its rights and regain full possession of the property, either by adjudication or by compromise, or by imposing new and troublesome conditions for retaining ownership, these

lands must be left to fate and the despair of the future.

The hope of the future must be found in the new deals the Government may make with the future limit holder, and this it should do with a full reckoning of the future.

It is needless to add that to carry out such a forest policy technical advice will be needed, and it will be my pleasant task to prepare young men for this business.

A UNITED STATES CONGRESSMAN ON CANADA'S PROPOSED PULP-WOOD PROHIBITION.

This is how the probable prohibition of pulp-wood by the Canadian Government appeals to at least one American Congressman, T. Littlefield:

"Canada has the largest supply of pulp-wood in the world. The country has vast timber resources, and there is already an agitation in the Canadas for an export duty on pulp-wood. Why are the Canadians asking for this export duty? It is because they want the mills, the millions of capital that would be invested, and the vast sums that would be expended for labor. They want all the returns their forests will give them, and they are right. It is laudable on their part, and it is just as laudable for us. While we stand on the proposition America for the Americans, they shout for Canada for the Canadians. The Canadians have not the same constitutional limitations as embarrass us in this country. Perhaps I should not say embarrass, for I believe that there is not one limitation in the constitution that is not necessary for our welfare and happiness. But while we are restricted from putting an export duty on any of our products the Canadians are under no such limitations. They already have export duty on some articles. One can see what an export duty on pulp-wood would do to the pulp manufacturers of this country in the experience of lumber operators in the Province of Ontario."

NATIONAL PAPER TRADE ASSOCIATION.

The 4th annual meeting of the National Paper Trade Association took place in New York on the 6th inst., President J. E. Linde taking the chair.

The following officers were elected: President, W. F. McQuillen, of Boston, Mass.; first vice-president, E. U. Kimbark, of Chicago, Ill.; second vice-president, John Leslie, of Minneapolis; secretary, T. F. Smith, of Louisville, Ky.; treasurer, E. E. Wright, of New York.

The reports of the various State Associations proved full of interest.

A banquet followed in the evening, at which members of the National Paper Trade Association and of the American Paper and Pulp Association jointly took part, and at which David S. Cowles, president of the latter and several other gentlemen delivered fine speeches.

—United States manufacturers are quietly scouring the woods of Quebec for pulp-wood supplies, and for some lots they are paying from $8 to $10 a cord for peeled spruce delivered at the station. The Quebec-St. Maurice Industrial Company have contracted with one concern for 30,000 cords of peeled spruce at $8.75 a cord delivered at Berlin, N.H. This would represent between $5 and $6 delivered at station.

—A syndicate with $5,000,000 capital has been formed in Montreal to build the Quebec and Saguenay Railway from St. Anne de Beaupre to Tadousac on the north shore of the St. Lawrence, a distance of about 120 miles. The building of this line, says Mr. Forget, who is interested in the scheme, will give the St. Lawrence a winter port. This is of importance as providing a possible new shipping port for pulp.

NORWAY'S PULP RESOURCES.

Increasing Demand Upon the Forests for Wood Pulp.

Felix S. S. Johnson, United States Consul at Bergen, contributes to his report the following review of the wood pulp industry of Norway:—

Both the wood pulp and paper manufacturing industries of Norway are in a flourishing condition. For a long time Norwegian pulp-wood has played an important part in supplying the world's wants, while a considerable local demand has been met. Thus, Norway's exportation of paper and products of paper amounted in 1906 to 97,413 tons, with a value of 16,353,200 crowns (crown = 26.8 cents), while the quantity and value of exportations of all kinds of wood pulp have been as follows for the years named:—

Year	Quantity Tons	Value Crowns
1869.....	60	9,000
1870.....	500	80,500
1871-1875.	4,587	395,000
1876-1880.	18,644	1,710,500
1881-1885.	67,909	4,704,600
1886-1890.	152,170	8,616,200
1895.....	246,225	13,467,600

Year	Quantity Tons	Value Crowns
1901	382,846	22,660,700
1902	447,470	24,736,800
1903	447,744	23,876,600
1904	445,260	24,290,600
1905	442,325	27,620,400
1906	505,627	31,982,400

Great Britain, France, and Belgium are the largest buyers of Norwegian pulp-wood, a portion of that exported to Belgium and Holland being sent in bond to other countries.

The principal countries competing with Norway in sales of pulp are Sweden, Finland, and Canada. The exportation in 1906 of wood pulp and cellulose from Sweden (according to the Commercial College) was 414,811 tons, and from Finland (according to the Central Bureau), 56,181 tons.

The price of pulp has in the course of years fluctuated a good deal. For example, the price of dry mechanical pulp in 1869, 1870, and a portion of 1871 was 150 crowns per ton; in 1891 the value of a ton was 29 crowns, which price was ruinous to the manufacturer. Prices of the several kinds of wood pulp in the month of August, 1907, per ton f.o.b. in Norway were as follows: Mechanical, dry, about 95 crowns; wet, about 50 crowns; chemical, dry, about 145 crowns.

The wood-pulp exports in 1906 may be classified as follows: Mechanical wood pulps, dry, 13,059 tons, and wet, 362,228 tons; chemical wood pulp, dry, 122,923 tons, and wet, 7,417 tons, a total of 505,627 tons. The share taken by each country in 1906 was as follows:—

Country	Tons	Country	Tons	Country	Tons
Sweden....	440	Belgium....	45,699	India.....	546
Denmark..	17,154	Spain.....	6,975	China.....	130
Russia....	101	Portugal....	924	Japan.....	425
Germany..	8,015	Italy.....	899	Australia....	300
Gt. Britain	292,371	U.S.....	19,277		
France....	85,808	Mexico.....	1,014	Total.....	505,627
Holland...	25,449	Argentine...	100		

The first Norwegian pulp mill was established in 1863. There are now 72 factories, 53 for the manufacture of mechanical pulp and 19 for chemical pulp. Wages of employees in the pulp

The portion shipped to the United States was entirely dry chemical wood pulp.

mills and paper factories were estimated at 7,500,000 crowns in 1906.

All of the machinery used in the manufacture of mechanical wood pulp and almost all of that used in the manufacture of chemical wood pulp is made in Norway. One factory uses in the manufacture of cellulose quantities of Norwegian pyrites. It is calculated that the proprietors of the forests receive 20,000,000 crowns in 1906 for wood used in the pulp industry.

Forestry Resources.

The development of the Norwegian pulp industry has been rapid, and although about 20%, or 67,500 square kilo metres, (kilometre = 0.62 mile), of the area of Norway is covered by forest, it is feared that if the consumption of wood continues at the present rate it will be only a matter of a very short time until the forests will be depleted. The price of logs has almost doubled since 1870, and they are largely exported as wood. It has been estimated, however, that the present national consumption of wood is not so great as formerly, owing, so the superintendent of the forests claims, to its high price. The Norwegian Government plants about 1,500,000 trees in the forests each year, and in addition much good work is done by individuals and societies interested in the maintenance and betterment of forests. The Norwegian Forest Society has since 1901 planted about 30,000,000 trees and cultivated or prepared large tracts of land. The Norwegian Storthing for many years has voted appropriations to this society, which receives like assistance from the Norwegian wood pulp and cellulose manufacturers, the association of lumber exporters, lumber merchants, and proprietors of forests.

CARTHAGE MACHINE COMPANY CHIPPER.

The Carthage Machine Company have been giving special attention to the wood room proposition and find that a great many mills have no idea how much can be gotten out of a good chipper. They have made a number of changes both in their chipper and chipper feed spout and nearly every mill in the United States has either a Carthage Chipper or one of their Patent Chipper Feed Spouts on their chipper. They have recently been building a large 4-knife chipper having an 88-inch disc and a spout that takes in wood 16 inches in diameter. This size spout of course means a great saving in wood, and also in the labor of splitting, as the largest spout heretofore has taken but 13-inch wood. The adjustable bed knife in the spout is sharpened every time the disc knives are sharpened and greatly reduces the power taken to run the chipper, and also does away with slivers and sawdust. A few among their many installations are the J. E. Henry & Sons Company, at Lincoln, N.H.; International Paper Company, 3 chippers and 3 crushers, and the P. H. Glatfelter Company, at Spring Forge, Pa.; Port Edwards Fiber Company, at Port Edwards, Wis., and the Burgess Sulphite Fiber Company, at Berlin, N.H.

—The John McDougall Caledonian Iron Works Company, Limited, Montreal, have issued a catalogue (Bulletin No. 102) illustrating several well-known recent installations of Worthington multistage turbine pumps. This bulletin is replete with descriptive matter and fine illustrations, and will be sent to those interested.

—Rev. Mgr. Laflamme, of Laval University, a few days ago, delivered an interesting lecture on "Forestry" before the May Court Club, Ottawa. His paper outlined the wonderful extent of the primitive forests, their decline for various reasons in past years and the efforts which have been made in many ways to protect them and accentuate their growth. The experiments which had been made in the matter of soils were also dwelt upon and it was hoped that Canada's magnificent forests would not suffer from "ignorantia vulgaris, indifferentia communicus or influentia politicus."

WATERTOWN PULP AND WOOD SUPPLY COMPANY.

The above is the name of a company with head offices in Watertown, N.Y., which was incorporated last year under the laws of the State of New York, for the purpose of buying pulp-wood in Canada and shipping it to several paper manufacturing companies in the United States. This object is significant, in as much as the paper makers in the Republic recognize they cannot much longer hunt for individual supplies of raw material either in their own country or in Canada, but find it expedient to join together and draw from one independent source of supply in Canada, over which they themselves will have control. The officers of the company are as follows: J. A. Otterson, president; J. M. Gamble, vice-president; C. H. Remington, treasurer; F. M. Hugo, secretary; W. C. Campbell; E. B. Sterling, general manager. They represent the following companies: The St. Regis Paper Company; The Remington-Martin Paper Company; The Norwood Paper Company; The Raymondville Paper Company; The Carthage Sulphite Company; The West End Paper Company; The Champion Paper Company; The Brownsville Paper Company; The Dexter Sulphite Company; The Carthage Tissue Mills; The Brownsville Board Company.

The company has an office in Quebec City, managed by E. B. Sterling, who is authorized to buy pulp-wood in Canada and ship it to the above companies.

It was understood that it was the company's intention to build pulp mills in Quebec Province, but J. A. Otterson of Carthage, N.Y., who is one of those largely interested, informs the Pulp and Paper Magazine that this is not the case. Evidently, while the Canadian Government delays in bringing forward measures for restricting or prohibiting the export of pulp-wood, the Americans think they may as well get all the wood they can in Canada and ship it to the United States for manufacture.

PROHIBITION OF PULP-WOOD EXPORT.

The following motions are significant of the feeling in Canada on the important question of prohibiting the export of pulp-wood.

J. Lewis, M.P., has given notice of the following resolution to be submitted to the Dominion Parliament: "That in the opinion of this House such an export should be placed on pulp-wood that will induce its manufacture into paper in this country and thus save Canada six million dollars now lost."

In the Quebec City Board of Trade J. F. Guay, seconded by Mr. Emile Tanguay, brought forward his notice of motion in regard to the prohibition of he export of pulp and pulp-wood. Mr. Guay made a lengthy speech in support of his motion, quoting freely from newspaper articles and authorities on the subject. Discussion was postponed until a later meeting.

"CHAPTERS ON PAPERMAKING"

By Clayton Beadle & H. P. Stevens, has proved so popular that Vol. I has run out of print, and a second edition has appeared, published by Crosby Lockwood & Son. As it consists of a reprint of six lectures, delivered before the Battersea Polytechnic Institute, the author has made no attempt to revise the text, the second edition being exactly the same as the krst. The book is a valuable one and this new edition will be appreciated.

RUTH CENTRIFUGAL SCREENS.

The Manson Manufacturing Company, Thorold, Ont., are meeting with unqualified success in the manufacture of the Ruth Centrifugal Screen. They have several orders on hand for leading Canadian mills, and have just placed two screens with .075 plates in the Thorold Pulp Company's mills at Thorold, Ont., and two with .075 plates in the mill of W. J. Morrill, Nicolet Falls, Que.

AMERICAN PAPER AND PULP ASSOCIATION.

The 31st annual meeting of the American Paper and Pulp Association took place in New York on the 6th inst., the attendance being larger than ever before. The dealers represented in the National Paper Trade Association, who held their convention at the same time, and who were invited to take part in the former Association's deliberations were informed that the uniform rules or trade customs, recently adopted by book paper manufacturers, would be amended to meet the wishes of the jobbing trade.

After the conference with the dealers there was a general discussion by the manufacturers of a number of pressing questions affecting their interests. Among the questions that were discussed were the depression in the trade, the shortage of wood, the agitation in Canada for prohibiting the further export of pulp-wood and the attack of the American Newspaper Publishers' Association. Strong resolutions condemnatory of the position taken by the publishers were adopted.

The meeting was called to order by David Cowles, the president, who spoke with conservative optimism on the prospects of the industry.

"Our industry," he said, "is a large one and important one. It is a difficult one. There is probably no industry in the country where raw materials, from the time the tree is cut until it is delivered in the form of paper and consumed by the consumers, takes so long a time. I think probably on the average it will run pretty near eighteen months."

On this he based a well thought out plea for more careful consideration of all the points which enter into the industry and for more careful judgment on the part of those who carry it on.

Secretary Louis Chable read his report, which showed the Association to be in a good condition as to progress for the past year. He then spoke of the extraordinary problem now before the trade, viz., the efforts which are being made to single out the paper industry as the first victim of tariff reduction, leaving it otherwise subject to conditions created by the high protection system.

Part of the report of C. H. Remington, chairman of the News division, was as follows: "Many millions of gold dollars have been given to publishers by robbing our forests. Is it not about time it stopped? Let us adopt an intelligent system of forestry. Let every piece of waste land in the country be planted to forest. Let all lands replanted to forest be exempt from taxation for a certain term of years. Encourage every farmer in the country to plant every part of his farm now unproductive to forest of some kind, and let that portion so planted, of course, under supervision of a proper board, created for that purpose, be exempt from taxation for a reasonable time or until such land shall have a commercial value. For every tree cut on any forest land, whether on public or private lands, cut for pulp-wood and lumber, or anything else, at least six trees should be planted. This should be made compulsory. Instead of trying to break our business down and force the new mills, which represent an investment of $100,000,000, to move to Canada, why do the newspapers not use their columns to build up the business, advocate preservation of the forests, the building of storage reservoirs, for water power purposes at the head waters of all streams in the country where practicable, and thus preserve their own existence."

GERMAN RAGS.

United States Consul Norton, writing from Chemnitz, says that the business in Germany of collecting and marketing rags, old paper and all material capable of utilization in paper making is very thoroughly organized.

More care is taken to save such cast-off materials and prevent their unnecessary destruction than is the custom in America. Rags enter to the extent of

nearly $5,000,000 into the foreign commerce of the Empire.

Cotton and linen rags, for paper stock, were imported in 1906 to the extent of 64,388 short tons, with a value of $1,393,128. The chief sources were, in tons, with value in each case: Belgium, 15,004, $324,652; France, 14,557, $314,976; Holland, 9,661, $195,818; and Russia, in Europe, 11,865, $256,731. The exports last year totalled 59,343 short tons, of a value of $1,283,971. The chief countries of destination with tons and value, were: Austria-Hungary, 8,307, $179,753; Great Britain, 11,341, $245,387, and United States, 23,866, $516,387. As will be seen, the United States is the chief country purchasing this article from Germany. The entire exports and imports nearly balance each other.

As is the case with most categories of rags imported into the United States, Germany levies no duties on foreign rags entering her territory. The trade with America in rags and paper stock generally is conducted almost exclusively by large dealers in the seaports, and chiefly in Hamburg. Chemnitz dealers report that they have no direct trade relations with foreign houses, although they often supply rags tightly pressed into bales to Hamburg houses for translantic sales. About 80 per cent. of the rags sold for consumption in Germany are taken by paper mills.

DETECTING ROSINS AND OILS IN PAPER.

It is often difficult to determine what rosins, waxes, or paraffins have been used in the manufacture of a given paper, says Papier-Fabrikant. This determination is, of course, necessary only in the case of papers intended for special purposes, whereby the addition of large quantities of such substances have been necessary. Among such papers tracing and parchment papers are the most important.

If the smell of such a paper does not enable even a person skilled in the various odours to arrive at the desired result the following method may be resorted to:—

Small fragments of the paper under examination are treated in a beaker with equal volumes of ether and alcohol. This mixture is allowed to act on the paper for about two hours. It is better to tear the paper up than to cut it, as the torn edges admit the solvent into the body of the paper more easily than clean-cut edges, which have necessarily undergone a certain amount of compression however sharp the cutting tool may be.

The two hours above mentioned may be cut down to fifteen minutes or so by heating the paper in the solvent. In this case, to prevent danger of fire, and to avoid waste of solvent, the heating should be done in a flask provided with a reflux condenser.

After the solvent has acted, a piece of the paper is removed and dried, and tested to see if the solvent has extracted all it can. If ink-writing on the paper runs at once and uniformly this is done. Should this not be the case, the treatment of the rest of the paper must be continued.

Finally, the solvent which now contains any rosins or oils originally present in the paper is evaporated to dryness over the water bath, and the residue is judged by its smell. If it is desired to extract oils only, the solvent used is merely petroleum-ether, which leaves rosin undissolved. After evaporation of the petroleum-ether the nature of the oil constituting the residue can be determined. If the paper is treated first with petroleum-ether, and then with a mixture of ordinary ether and alcohol, the evaporation of the second extract gives any rosin which may have been in the paper.

CASEINE TESTING.

Users of caseine will do well to buy only a pure product, and to dissolve it

themselves by the aid of the necessary reagents. This method of procedure is to be recommended from every point of view. It enables the consumer to have always at his disposal a solution of the exact strength which experience has shown him to be best suited to his requirements. As everyone acquainted with the subject is aware, this is a matter of great importance. Many products, and caseine among them, are put upon the market in different forms and under different names, so that it is almost impossible to value them except by the test of use, without paying much attention to the representations of the sellers.

It should be remembered that most of the adulterants of caseine are soluble in cold water which caseine itself is not. Persons who buy " soluble " caseine are confronted, when they desire to form some opinion of the usefulness of their purchase, by the necessity for a difficult and expensive chemical analysis. The solvents employed in the preparation of such products are generally intentionally complicated solely with the purpose of throwing an investigator off the scent, and leading him to suppose that some substance which has been added merely for that purpose is an essential ingredient of the product offered for sale. Thus borax, the common solvent, is associated with sulphites and phosphates of soda. To these are also added traces of lactates, sulphates, and chlorides. These products make it impossible to tell how caseine has been coagulated.

Insoluble caseine, granulated or powdered, can be analysed without any previous preparation. To test for iron, put a good sized pinch into a porcelain crucible, then adding a drop of sulphide of ammonium, which will give a bluish black color, if any injurious amount of iron is present. Numerous experiments have shown that this is a very important test, inasmuch as it supplies data for judging of the care bestowed on the manufacture of the caseine. If, for example, old rusty iron gratings are used for drying instead of wooden frames, or if the coagulation is done with sulphuric acid containing much iron the caseine, which is always acid, however well it may have been washed, absorbs the iron greedily.

IMPROVED ACID TOWER.

James Bishop, of Carthage, N. Y., U.S.A., has invented and patented an improved tower for making acid for sulphite fibre mills. Mr. Bishop does not use the crude limestone, but lime water, or the milk of lime, as it is called, which is pumped to the top of the tank and allowed to drop through several series of wooden blocks which are placed over grate bars located at regular intervals down the shaft. The sulphur fumes are introduced from below and rise through grates and heaps of blocks.

FOR SALE

One second hand revolving rag boiler, in first-class condition, driving gear and all complete, Dimensions : 6 feet diameter by 25 feet long, with 2 doors, working pressure 50 pounds per square inch. For price and further particulars apply to the Cornwall Paper Manufacturing Company, Mille Roches, Ont.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

POSITION WANTED.

Superintendent open for Engagement.

A1 on Book, Bond, Blottings and Coating Stock 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc Address M. R. J. care Pulp and Paper Magazine, Toronto.

Position Wanted

A mill manager, having experience in the manufacture of Kraft Brown both in Sweden and England, is open for an engagement with a Canadian mill. Is able to take charge of a paper mill as manager or assistant manager. Address "Kraft," c/o Pulp and Paper Magazine.

The blocks give a large surface, and an opportunity is afforded for chemical action necessary to produce the acid. As the acid is formed it drops to the bottom of the tank, and is drawn off to be used as needed in the digester. Mr. Bishop's claim for his invention is that it will result in a great economy of labor, the making of a more uniform liquor, lighter construction of the tower, more rapid action and a smaller expense in operation. Instead of a heavily built tower, Mr. Bishop proposes to make a tower of 2-inch stuff with comparatively light hoops, and he says that there is no reason why one of them should not last a lifetime. The use of blocks is for the purpose of retarding the flow of lime water. The rise of the gas is aided by a draft pipe at the top of the tank, into which a steam pipe is introduced. The operation of the tower may be continuous, while in the old-fashioned ones a day or two of each week is taken up in cleaning out the tank and removing the refuse. Mr. Bishop's invention has been tested at the plant of the Carthage Sulphite Pulp Company, and found to work well. Mr. Bishop has been connected with the sulphite mills in Canada and the United States for the past eighteen years, and has made many improvements and inventions of value to the paper manufacturer.

LIMITS IN QUEBEC PROVINCE HELD BY AMERICANS.

The following is a list compiled by the Paper Mill of the large American companies owning limits in Canada. It also shows, in consecutive order, their owners or head office, the name by which the Canadian branch or firm is known, the location of mills or limits, and the square miles of territory controlled:

International Pulp and Paper Company, St. Maurice Lumber Company, Three Rivers, Batiscan and Pentecost, 3,200; Brown Brothers, Berlin, N.H., Quebec and St. Maurice Industrial and Dvpt. Company, La Tuque and St. Maurice River, 1,000 (freehold, 166,000 acres; equal to about 16,600 miles); Brown Brothers, Berlin, N.H., Burgess Pulp and Paper Company, River Croche and St. Maurice River, 700; Union Bag and Paper Company, Union Bay and Paper Company, Charlemagne (1), Three Rivers (2); principal mills, Sandy Hill, N.Y., 2,000; W. and M. Jas. Clarke, New York and Toronto, North Shore Power and Navigation Company, Clarke City, 762; Bayless Pulp and Paper Company, Binghamton, N.Y., St. Anne Power Company, Beaupre, 125 (cutting rights of Beaupre Seigniory); Bayless Pulp and Paper Company, Binghamton, N.Y., Bayless Pulp and Paper Company, St. Gabriel, Que., 300 to 400; Head Office, Portland, Me., Saguenay Lumber Company, Escoumains, Que., 407; Battle Island Pulp and Paper Company, Fulton, N.Y., Battle Island Pulp and Paper Company, St. Alphonse, 100 (cutting rights from settlers).

Besides the above may be mentioned the Watertown Pulp-wood Supply Company, referred to elsewhere in these columns; and the Hammermill Paper Company, Erie, Pa., which has an office also in Quebec

THE PAPER MILL CHEMIST.*

The object of this book is to provide in a handy form all information necessary for making chemical and physical tests on paper and on the raw material of which paper is made; also tables of data in a convenient form for reference. A good index, also many cross references in the text of the book add greatly to its value. Lists of the English and metrical systems of weights and measures; the methods of chemical analysis; fuels; waste; required for paper making; detection of adulterants in the raw material; paper testing; size and weight of paper; paper trade customs; are the subjects chiefly discussed.

* The Paper Mill Chemist. By Henry P. Stevens, M.A., PhD., F.I.C. Published by Scott, Greenwood & Son, 8 Broadway, London, E.C. Price (abroad) 7s. 10d.; post free.

SECURITY PAPERS.

These papers are made in various ways, but they are intended to betray any alteration or erasure of what was originally written upon them. Thus they find special employment for financial papers, e.g., post office orders, cheques, promissory notes, etc. It is true that the perfection now attained by the printing trade has made forgeries of whatever kind more difficult than they used to be. Complicated designs printed on monetary paper are by no means calculated to assist falsifiers, if the blocks from which they are printed are safeguarded as they should be. The function of the paper itself is quite independent of these considerations. Its duty is to receive the genuine impressions without fault, and at the same time to give evidence of additions, erasures, or alterations. The following is an account of the methods employed for preparing these papers:—

The most primitive method consists in the use of a watermark. It is not difficult to counterfeit a watermark, but a watermark should be accepted as a proof of the genuineness of a document only when the quality and nature of the paper create no suspicion. To put an extreme case, a Bank of France watermark on ordinary notepaper would almost be a proof of forgery without any other evidence.

Some countries use for banknotes and other current paper--moneys the paper known as Willcox paper. In this paper fibres dyed blue and red are placed upon the pulp just before the paper is finished, and hence they do not adhere very strongly, and can be picked off the finished paper with any sharp point such as that of a needle or a pin. The only practical method of imitating such a paper is to print on the colors so as to counterfeit the parti-colored appearance of the genuine paper,but it is obvious that if this is done the needle point cannot pick out colored fibres without injuring the rest of the paper. This kind of paper is extensively used in German State offices, and in Austria it is manufactured for use in Greece for banknote printing.

As regards the prevention of alteration of the words on a document of any kind, numerous proposals have been made, and many of them have been patented. The principle invariably adopted is to prepare paper which contains substances which, while having no effect upon printing ink, destroy any writing ink with which it may be attempted to falsify the document. One of the methods is that of Ballande in Paris. This process is to mix calomel (mercurous chloride) with the pulp during the manufacture of the paper, or to paint it upon the finished paper with a vehicle of dextrine or gum arabic. This paper requires that the authentic writing upon it should be done with a special ink—viz., one consisting of a solution of ordinary alum and sodium hyposulphite. This ink gives on the prepared paper black letters which cannot be destroyed unless the paper is destroyed with it. Zeiss, of Berlin, has worked out a method which consists in printing on to the paper three colors—two visible and one invisible. The two visible colors are exactly the same in tint and shade, but widely different in chemical composition. The point is that one should be fast, the other quite the reverse of fast—in other words, very loose—and that the latter should be printed over the former.

If paper has been so treated, whether the printing takes the form of letters or not, and attempts are made to tamper with it, the loose dye is destroyed, and other dye, formerly concealed, appears. At the same time the invisible color is acted upon, and comes out dark. The whole result is that the whole appearance of the paper is so radically changed that the forger would never dare to present it. It is evident that the fast printing may be anything we like, as long as the over-printing with the loose dye, which makes the genuine document, covers it. Another point, which hardly needs mentioning, is that the fast dye

used must have no mordant action on the loose dye with which it is topped.

W. Hoskins and J. B. Wells have patented a safety-paper, prepared by mixing into the pulp 5 per cent. of phosphate of iron, 2 per cent. of phosphate of manganese, and 5 per cent. of ferrocyanide of potassium. Paper so prepared gives blue stains when it is tampered with by means of acids, and brown stains if alkalis or salts are used upon it.

It is evident that all such papers must be expensive, but the cost of the paper used in making bank-note or paper currency of any kind is, of course, an entirely secondary consideration.—Berlin Centralblatt.

WATERMARKS.

The discovery of the watermark was the result of an accident—probably a thousand years ago. Parchment was then made of vegetable pulp, which was poured in a liquid state into a sieve; the water dripped out from below, and the thin layer of pulp that remained was pressed and dried. When dry it was found to bear upon it the marks of the fibre that composed the bottom of the sieve.

These fibres seem to have been twisted reeds, and the mark they left on the parchment took the form of wide lines running across and across diagonally. In those days the watermark was regarded as a blemish since the fiber was thick and coarse and the deep impression made on the paper proved a drawback in writing. The quill of the scribe found many a yawning gap to cross on the surface of the manuscript—"switchback scripture" it has been termed. But when wire was substituted for fiber in the sieve the lines of the watermark grew thinner and less conspicuous.

The possiblities of the usefulness of the watermark became apparent by degrees. It was first found to be of service in preventing the forgery of books and manuscripts. Many a bogus copy of a rare work has been detected because the counterfeiter failed to take into account the watermarks of the original. The watermark of many a precious manuscript in the world's museums is alike its glory and its safeguard. And in the sphere of bank notes and paper money everywhere the watermark is most useful in protecting the notes from imitation.

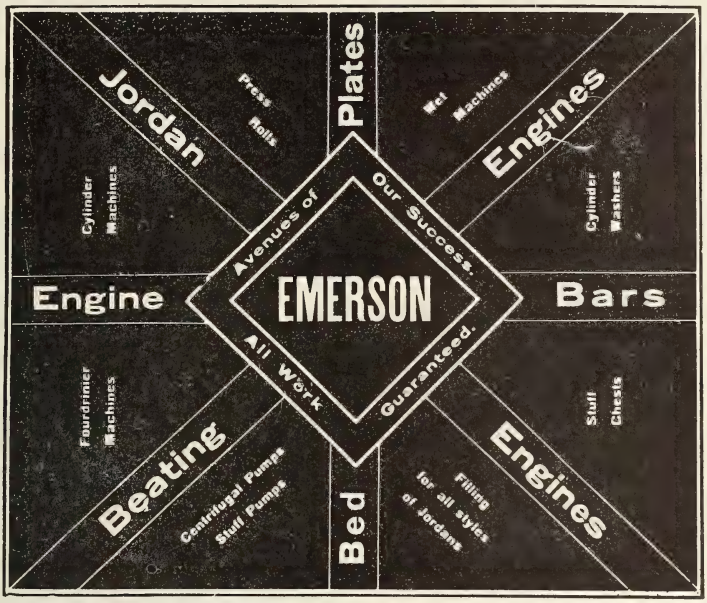
The term "watermark" is in reality a misnomer since the mark is actually produced by wire. Wire is fashioned into the desired pattern, figure or lettering. This is inserted beneath the sheet in the last stages of its manufacture and while the paper is still capable of receiving the impression the wire device stamps itself into the sheet. Ordinary note paper held up to the light reveals hundreds of parallel lines running up and down, betraying the fact that the paper was made on a wire foundation. To this the paper owes its smoothness and its even texture.

In the manufacture of postage stamps the watermark is of immense advantage as a safeguard. The wires that produce the marks are kept strictly under lock and key. They are brought out only when wanted, and an inspector keeps an eye on them till their task is done, when they are at once locked up again.

C. A. Meincke & Company, 222 Coristine Building, Montreal, have been appointed Canadian representatives of the China Clay Company, Manchester, England. This company have six large mines in Cornwall, and are special contractors to H.M. Indian Government.

—The Printing Art Sample Book is a splendid combination of good typography, good presswork, good illustrations, and good matter of interest to printers, publishers, advertisers and those engaged in the allied trades of binding and engraving. A useful feature of this new monthly magazine is the samples of standard and special papers adapted to all kinds of work. It is issued by the University Press, Cambridge, Mass.

EMERSON MFG. CO.

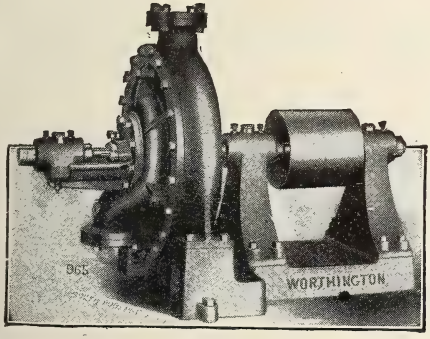


LAWRENCE, = = = MASS.

The John McDougall Caledonian Iron Works Co.

LIMITED

MONTREAL, P.Q.



Worthington Turbine Fire Pump, working pressure 160 lbs.

BOILERS:

Return Tubular "McDougall" Water Tube, etc.

TANKS:

Water Tanks, Penstocks, Steel Riveted Pipe.

Hydraulic Presses:

For Pulp and Paper Mills.

Builders in Canada for "WORTHINGTON" TURBINE PUMPS, CONDENSERS, Etc. and New York Filter Co's. Pressure Filters.

CANADIAN "NEWS" IN AUSTRALIA

D. H. Ross, Canada's Trade Agent in Melbourne, reports that large orders are going forward by recent mails for Canadian news paper, which is now well established on the Australian market The quality of the paper, competitive prices and excellent representation are responsible for this satisfactory condition of affairs. Canadian wall papers are in excellent demand, and business is being done for some manufacturers in the Dominion who were hitherto not represented in that part of the world.

THE MARKETS.

Toronto, February 22, 1908.

Considerable difference of opinion exists as to the real state of the paper trade, some declaring that no cause for complaint exists, others that business is away behind other years. The truth probably is that while the financial stringency of the past fall kept back quite a lot of orders, yet these conditions have now been largely overcome. For news the demand is good; particularly so since the beginning of the year, though in the United States we understand this can scarcely be said to be the case. Book and writings however are distinctly dull, with comparatively little enquiry. Pulp has been a little on the easy side compared with recent months. But the makers have shown no tendency to reduce prices on present stocks, as the cost of production is still high though wages in the woods rule considerably lower than they were. Ground wood fetches from $22 to $26 at United States mills, and sulphite $2.10 to $2.50 according to quality, etc.

British.—English paper makers are complaining bitterly about the high prices demanded for ground wood pulp. The ruling quotations are £3 2s. 6d for moist, and £5 10s. to £6 for dry. Not much business is passing for sulphite. More business is reported for chemical pulps. Chemicals are steady says World's Paper Trade Review. Ammonia alkali, 58 per cent., stands at £4 10s. to £4 15s.; bleaching powder (soft wood), £4 5s. to £4 7s. 6d.; caustic soda, 76 to 77 per cent., £11; soda crystals, £3 2s. 6d.; salt cake, £2 2s. 6d.; and recovered sulphur, £5 to £5 5s.

PAPER STOCK MARKET REPORTS.

Montreal, February 21, 1908.

There is not much change in prices of paper stock. Quotations range about as follows:—

Unbleached cuttings	$4 to $4 50
White shoe clips	4 50 to 5 00
Colored Shoe Clips	3 00 to 3 25
Domestic white rags	2 25 to 2 50
Blues and thirds	1 25 to 1 50
Roofing stock	85 to 95
Manilla rope	2 50 to 2 75
Waste papers	90 to 45
Bagging	85 to 90

TRADE ENQUIRIES.

The following inquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these inquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or publishers "Pulp and Paper Magazine."

Packing Paper.—A Birmingham firm using all kinds of packing paper is prepared to purchase from Canadian exporters.

Wood Pulp Boards.—A Manchester firm desires to obtain c.i.f. prices of wood pulp boards from Canadian manufacturers.

Pulp-Wood.—A Manchester firm with extensive connections wishes to correspond with Canadian exporters of pulpwood.

THE **Swenson**
EVAPORATOR

Boils off Water, not Spent Caustic.
Is easily kept clean.
Seldom repaired, and then with ease.
Works most Rapidly and Efficiently.

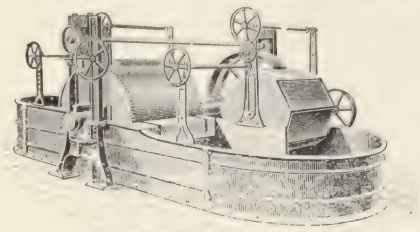
American Foundry & Machinery Co.
(Formerly WALBURN-SWENSON CO.)
Works: CHICAGO HEIGHTS. 944 Monadnock, CHICAGO

THE UNITED WIRE WORKS LTD.
Edinburgh, Glasgow & Newcastle on Tyne.
FOURDRINIER WIRES
CYLINDER WIRES
Wire Cloth all meshes, in Brass, Copper Bronze & Steel.
SOLE AGENTS FOR CANADA
ARTHUR P. TIPPET & Co. 8 Place Royale, MONTREAL.
Wires held in stock at Montreal for prompt delivery.

HOLYOKE MACHINE COMPANY

HOLYOKE, MASS., U.S.A.

MANUFACTURERS OF



Machinery for Wood Pulp and Paper Mills.

Vertical and Horizontal Water Wheels with Flumes and all connections.

Wood Barkers, Wood Chippers and Wet Machines.

Washing and Beating Engines with Patent Double Hoist and Tubs of either wood or iron.

Hydraulic Pumps and Presses.

Rag Cutters and Rag Dusters.

Newest Designs

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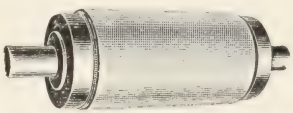

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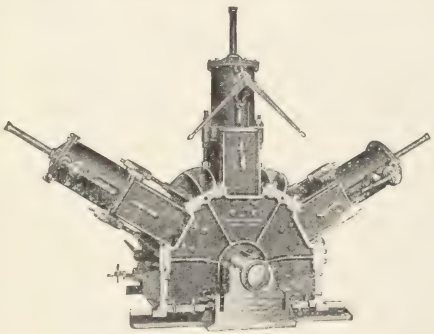

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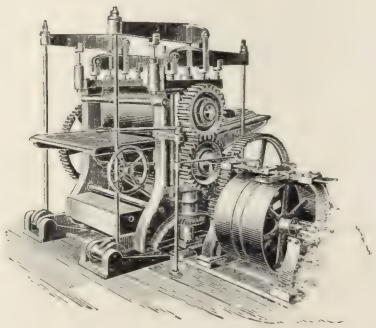

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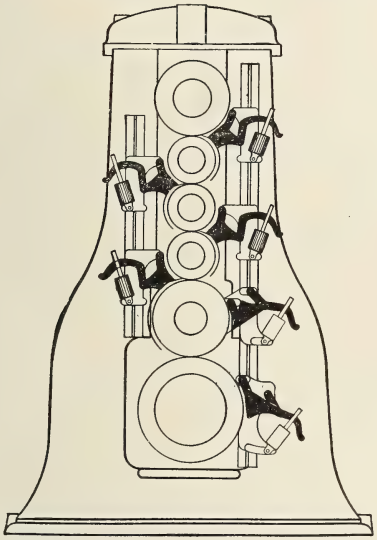

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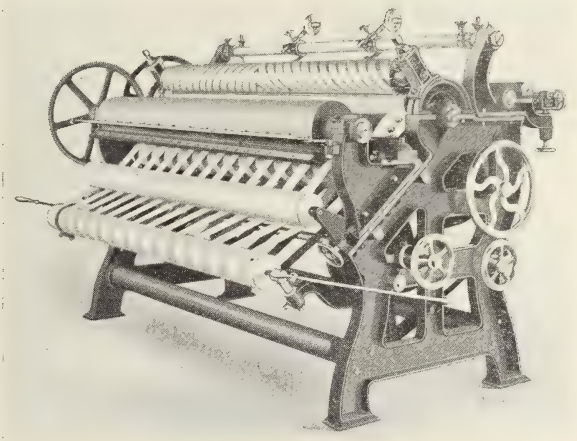

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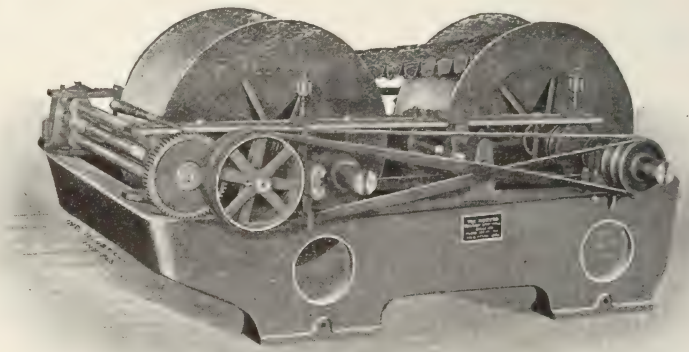

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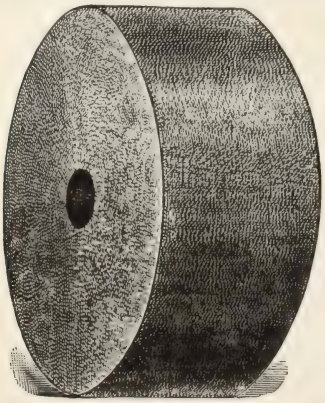

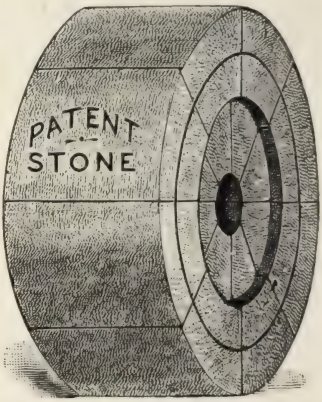

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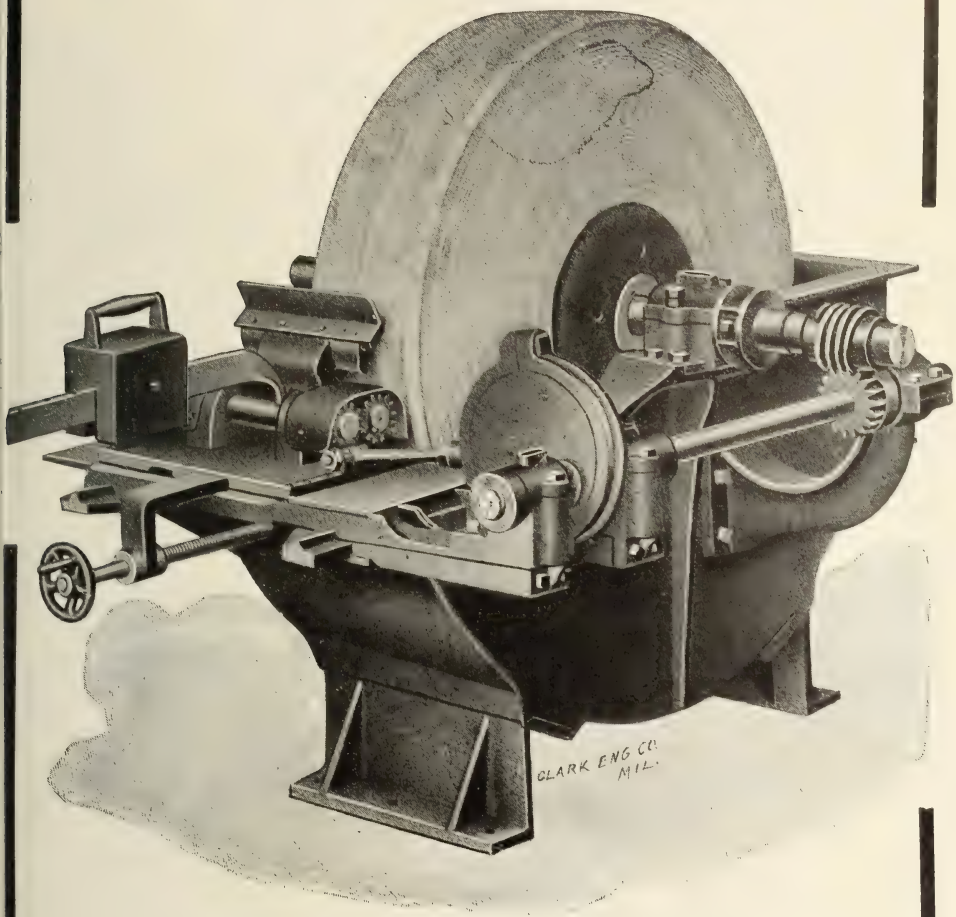

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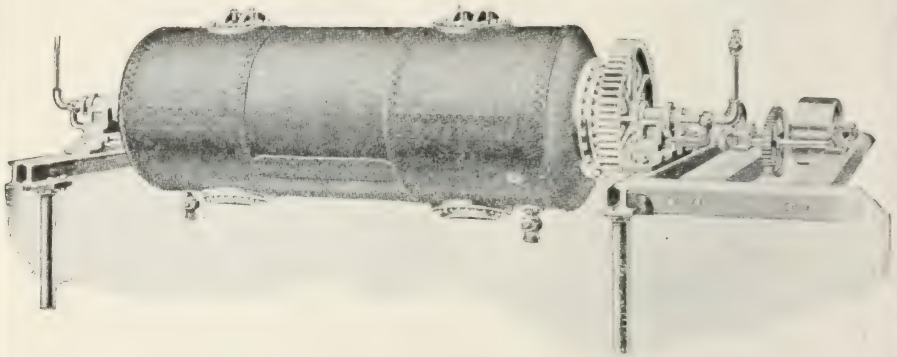

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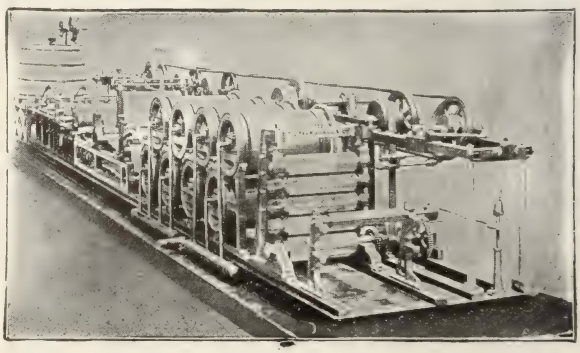

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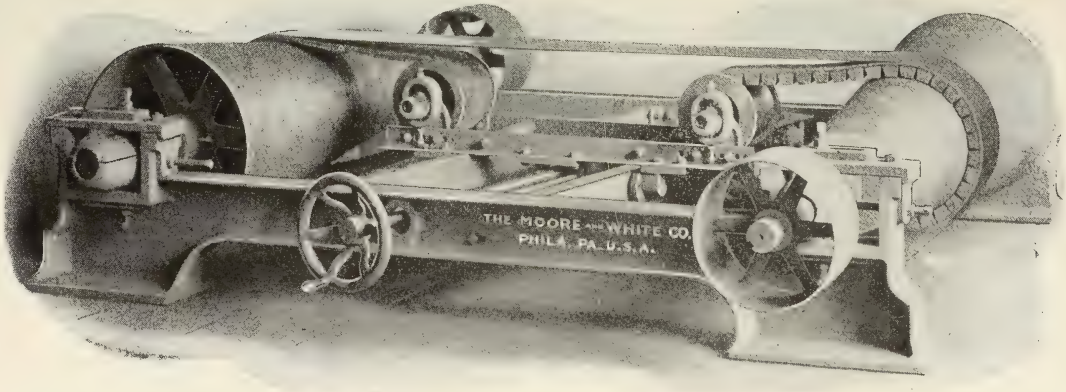

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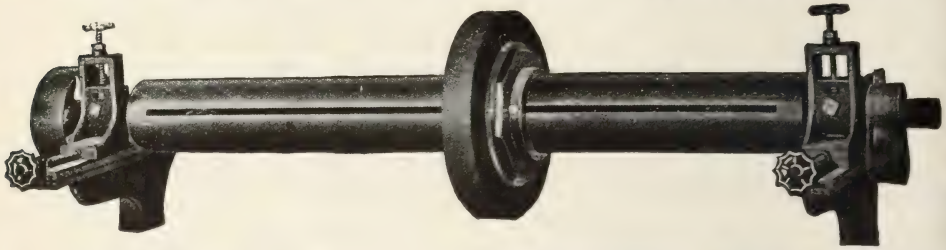

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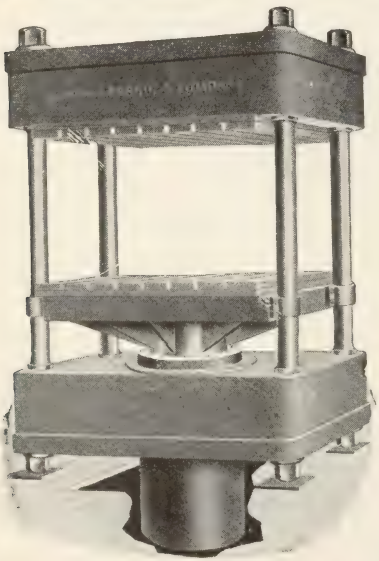

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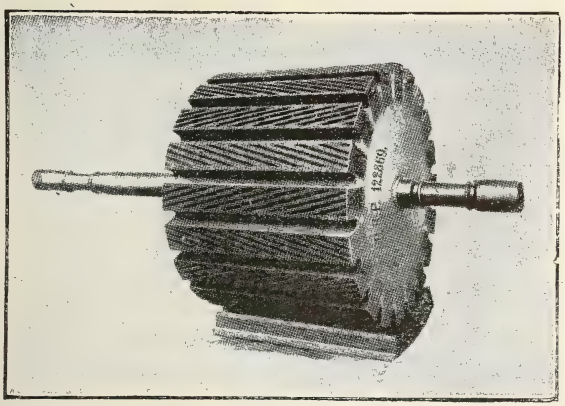

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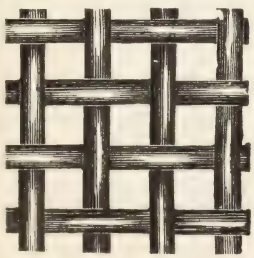

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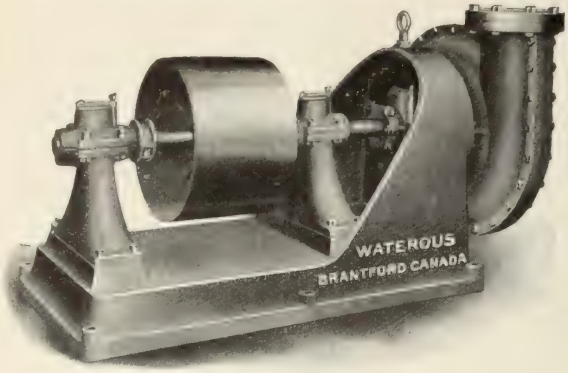

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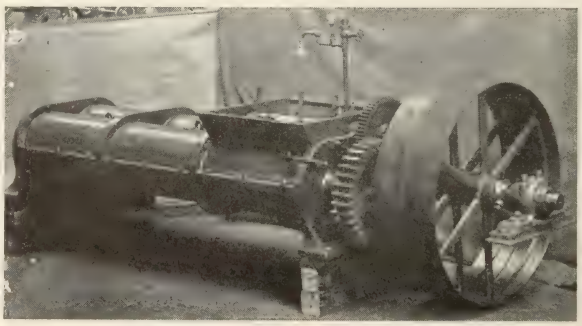

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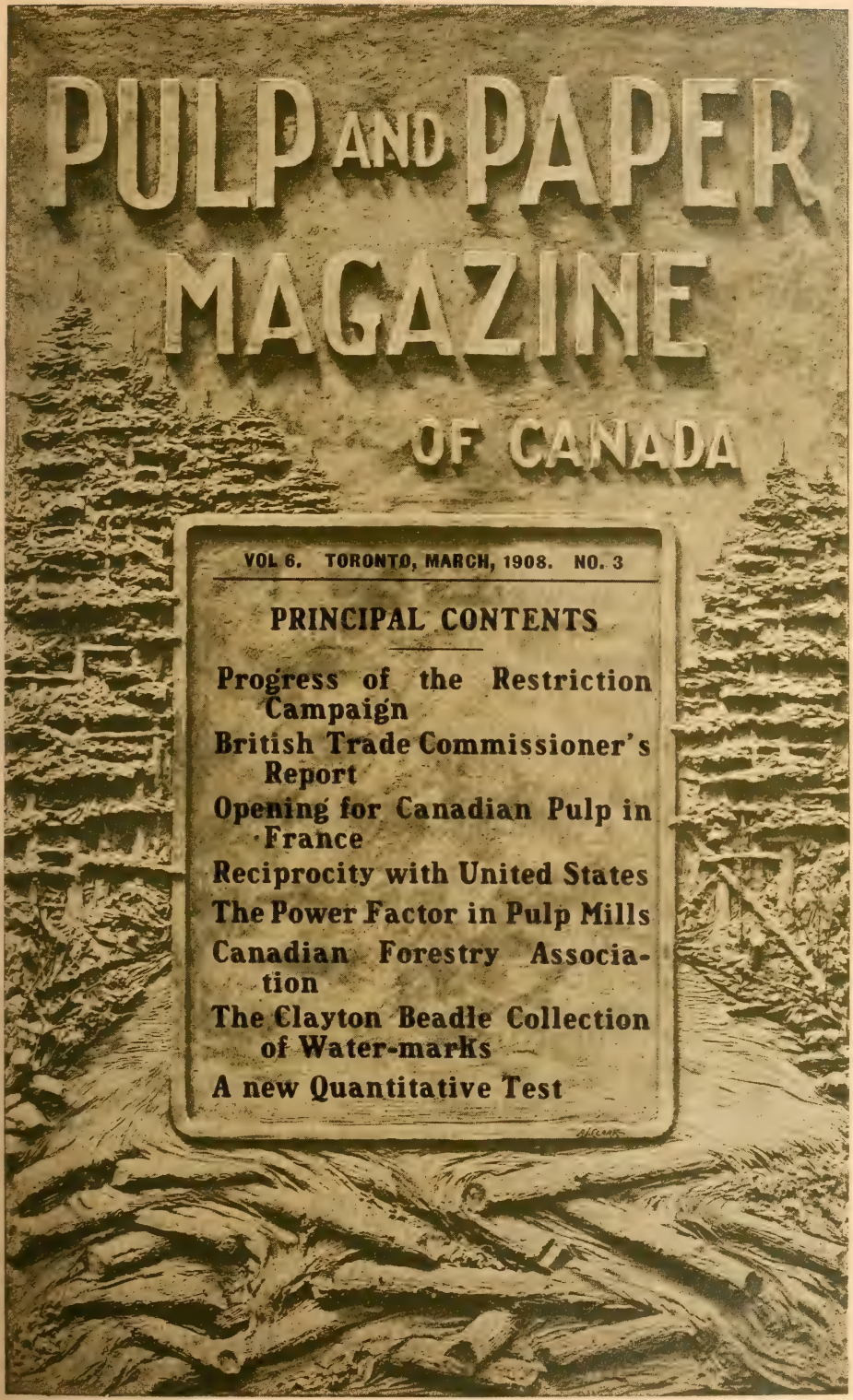

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The Clayton Beadle Collection of Water-marks
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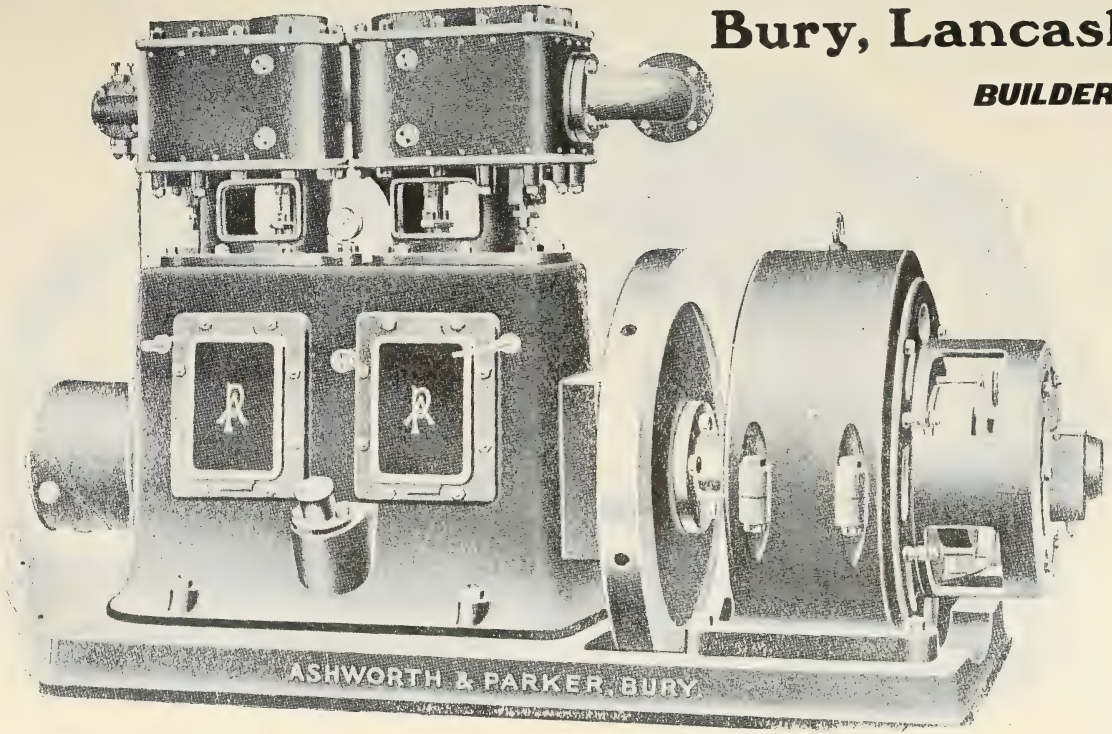

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—Senator Baird has given notice that he will move the following resolution in the Senate on March 24th:—"That in the opinion of the Senate it is advisable that a commission be appointed, consisting of representatives from the different Legislatures of the several Provinces, together with such other persons as may have the management of the Crown lands of Canada, with power to report on the best means to adopt for the preservation of our forests in the best interests of Canada, in view of the large amount of logs and pulpwood that are annually exported from Canada."

—Heyman Ridder, president of the American Newspaper Publishers' Association, declares in a letter to President Roosevelt and Attorney-General Bonaparte, that the effect of the alleged efforts of the American Paper and Pulp Association to stifle competition and increase prices has been to put an additional burden of $60,000,000 per annum upon the printing and publishing interests of the country without justification other than the power of combination.

—J. Marx & Company, 133-139 Finisbury Pavement, London, E.C., papermakers' engineers, have sent us a list of the mills which are now using their Basalt Lava Stone Beater Rolls. The number of these rolls, either already installed or on order, is the best testimonial possible that can be given regarding the confidence with which they are regarded in all parts of the world. Besides mills in the United Kingdom, the list includes a whole host of mills in Germany, and many in France, Belgium, Holland, Sweden, Italy, and other countries.

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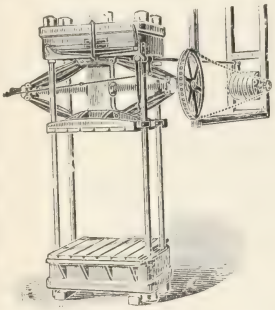

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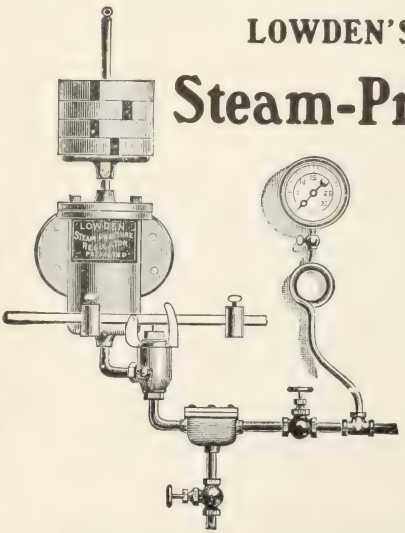

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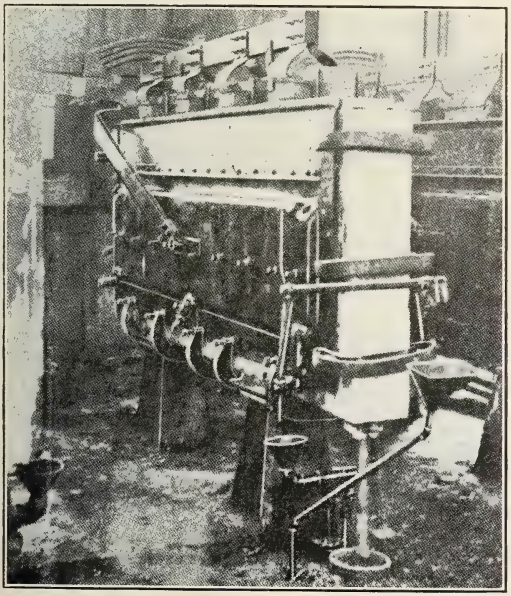

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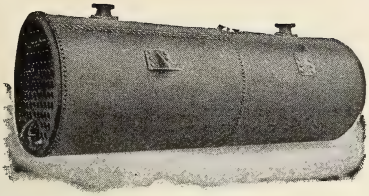

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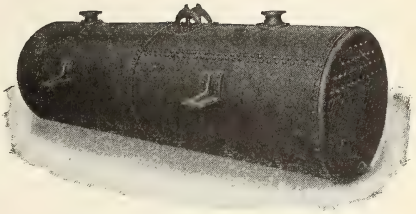

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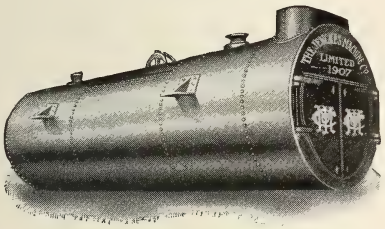

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THE
PULP AND PAPER MAGAZINE OF CANADA

Vol. 6.—No. 3. TORONTO, MARCH, 1908. $1 A YEAR SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month, and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

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PROGRESS OF THE RESTRICTION CAMPAIGN.

Once upon a time, a man settled on some forest land in Pontiac County, Quebec, far from other settlements. He grew a crop of potatoes, and in clearing the land for these he started a fire which destroyed 300,000,000 feet of pine. At present prices this pine would be worth $390,000 to the Government in stumpage fees, $1,800,000 in lumbermen's wages, and probably $1,200,000 in profit to the limit holder; altogether $3,390,000 of good money. The crop of potatoes amounted to five bushels, worth at the outside less than $5, and that country to-day is a desert worthless for any purpose whatever!

Canada to-day is letting her live neighbor to the South get hundreds of thousands of cords of pulpwood at a price ranging from say five to eight dollars. These same cords of pulpwood bring $30 to $50 in the shape of paper.

The two great national wastes which these two facts so pointedly exemplify are taking hold of the popular mind in a way that will make the campaign of education proceed at a rapid pace.

And this it is certainly doing. The movement in favor of restricting the export of pulpwood is growing on all hands—in the press, in Parliament, and in popular estimation.

In the Dominion House of Commons, E. N. Lewis, member for Huron, moved "that in the opinion of the House such an export duty should be placed on the export of pulpwood as will be sufficient to induce its manufacture into paper in Canada, and thus save to the labor of Canada the six millions of dollars now lost."

He said:—"We, in Canada, have no desire for our cousins across the border to be without their daily paper. All we wish is that the product of our forests shall be manufactured in Canada and then shipped to them. With our help they must follow the views of a celebrated United States editor of whom a brother journalist once said:—'To him every cloud has

a silver lining. If it has not, he's just the man to climb up and paint one on.' We are told that the country to the south of us, once covered with a grand, majestic forest, one of the main sources of the wealth and power of that nation, is now a dreary waste, a vast void, so to speak, and that such void will soon be duplicated in Canada. Now, sir, I am an optimist, and I believe no Government of Canadians will be so lax as to allow such to occur here. I can see no dreary waste, no void, for Canada."

"What does Canada get for all its production of pulpwood?" he asked the House.

"(1) The Government, not $1 a cord.

"(2) The chopper, the loader, the river driver, the teamster, the peeler, not much more.

"(3) The railways, a low rate on coarse freight. The whole result, $6 or $7 per cord left in Canada. Why, sir, they don't even allow us to carry the pulpwood in Canadian vessels. I have here a list of fourteen steamships carrying pulpwood last season from Quebec ports to Wisconsin ports, twelve of which were United States vessels and two Norwegian.

"Now, sir, I repeat again, $6 or $7 left in Canada for every cord of pulpwood leaving it."

And then he gave figures to show the result of grinding up our own wood in this country; and told the farmers who have pulpwood for sale how they would be helped by an export duty more than anyone else. The sale would be just as great, more people would live in their neighborhood to use their products in other lines.

The pulp and paper industry, he said, gives more healthy and steady day and night employment to a larger number of men and women at higher wages all the year round than any other industry in Canada.

Dr. Beland and one or two of the members from Quebec Province took the view that the farmers south of the St. Lawrence and east of Montreal would be hurt by the proposed restriction of their market, and that it was not the duty of the Dominion Government to take this step but rather the duty of the provinces to make regulations for stumpage, prevention of fires, etc. However, they made no objection to the appointment of a commission of enquiry.

The Canadian Press Association also at its convention in Toronto, had a thorough enquiry into this subject, the discussion being started by an address by E. B. Biggar, of the "Pulp and Paper Magazine." He gave, in condensed form, the arguments which have appeared in this journal from time to time, and engaged the close attention of the meeting. The publishers present saw the danger to which they would be and are exposed by the possible exhaustion of Canada's pulpwood supplies, and a resolution finally carried to appoint a committee to take up the economic and commercial aspect of the subject, and discussing means for the protection of the interests of the press. We think that if the press as a body would look a little more to the national interests represented by policies of forestation and forest conservation, and a little less to the party advantage to be obtained from laudation and from criticism of the same, it would be much better, not only for the press itself, but for the whole country.

That the true interests of the Dominion are invested in a proper development of the paper industry is illustrated in a

happy manner by the growth and prosperity to be seen on every hand where a district full of pulpwood contains a paper mill. Take the case of Grand Mere, Que., for instance, the prosperity of which has been built up almost alone on the enterprise of the Laurentide Paper Company, which operates the big mill there.

On all hands we see evidence of a growing disposition to recognize the seriousness of any carelessness on the part of legislative bodies in providing for the necessities of the future in the way of lumber and pulpwood supplies. The Ontario Government foreshadows a new forestry policy, one point of which is to settle the claims of license-holders. Another is that the alienated power of regulation and supervision must be regained. The new policy, however, has not yet taken definite shape.

BRITISH TRADE COMMISSIONER'S REPORT.

Canadian manufacturers of papers as well as of other articles, are extremely interested in the report of Richard Grigg who was in this country a year or so ago investigating trade relations between Canada and the Mother Country.

In stepping out of the beaten track by sending a Trade Commissioner to Canada to enquire into trade conditions as they affect British merchants and manufacturers, the British Government did the right thing, though, perhaps, not at the right time. They not only did the right and practical thing, but they chose the right man, for Mr. Grigg, who explored Canada last year, has already made his report, and the collection of facts and figures which he has set before the British public in the blue book published under the auspices of the Board of Trade must set the manufacturers and merchants of the Mother Country to thinking.

It seems strange to Canadians that, although every British consul in foreign countries is charged with looking after the commercial as well as the political interests of his country, the trade of some of these countries being worth but very little, no one is appointed to look after British commercial affairs in Canada and the other large British colonies, whose trade is becoming of such prime importance. And all the while the United States, Germany, and other countries have, by their alert consul in Canada, been keeping their people in direct touch with the commercial developments of the Dominion. Mr. Grigg's mission should have been undertaken ten years ago, and if it had been followed by the establishment of British commercial agents in the leading cities of Canada full advantage could have been taken of the preferential tariff, and trade to the extent of millions of pounds would have been secured by British firms which has drifted into foreign channels. However, this is not the fault of Mr. Grigg, nor of Hon. Lloyd George, who deserves high credit for breaking away from the traditions of office as he has.

In his instructive report Mr. Grigg points out that the recent course of trade shows Great Britain holds her own in Canada in those branches of trade in which she has been predominant in foreign countries. The British paper maker, he thinks, can hardly expect to build up a large export trade with Canada, as the production of pulp and paper

in this country is growing rapidly, and is destined to assume very large proportions. British and Canadians probably understand each other's conditions less well than the Americans and Canadians, and British manufacturers also are less willing to take chances than Americans and not as ready to adapt goods to the needs of the market. A buyer in Nova Scotia informed the Commissioner that parchment paper used for wrapping butter is a considerable import, and imitation parchment paper used for wrapping hams, bacon and other greasy substances is also imported. Flint and dead finish glazed papers are obtained principally from Germany. The buyer referred to adds: "We are so close to the Boston and New York markets that it is difficult to exercise our natural preference for British goods." The report enters at considerable length into the development of the pulp and paper industry in Canada, also into the state of the paper trade between Great Britain and this country.

The causes of the advance of American and other foreign wares in the Canadian market are dwelt upon by Mr. Grigg, and generally they confirm the explanations given in the Canadian trade press. British manufacturers, he says, have depended very much on merchants and agents, while their competitors have come over to Canada to get into direct touch with, and learn the wants of, their customers. Americans and Germans also take more trouble to meet the needs of buyers, and this has given rise to the impression that British firms are indifferent to Canadian trade.

Mr. Grigg points out faults in British methods which it has been difficult for trade journals to emphasize for fear of being thought to be actuated by self-interest—that is their failure to carry out systematic advertising in a country where trade advertising is the almost universal practice. He says: "The desirability of more energetic and better planned advertisements is constantly urged." Thus it is pointed out that the circulation in Canada of United States literature with advertisements of United States machinery is very great, while there is only a small circulation of British literature. When British traders do advertise, it is said they frequently fail to do so in the right way and in the most suitable journals, while United States manufacturers have made a scientific study of the matter.

The maintenance of stocks in Canada is also urged, and the failure to keep goods ready to deliver to Canadian customers when wanted has accounted for many a connection lost by British manufacturers in some lines. It is also pointed out that both British and American trade in Canada have to encounter the growing rivalry of Canadian industries, which, however, offer great opportunities (hitherto comparatively little used) for the investment of British capital.

Mr. Grigg goes fully into questions of ocean and railway freight rates, and in the 117 pages of his report gives a mass of facts, the digestion of which we trust will show what British merchants and manufacturers must do to recover the ground they have lost and create new lines of trade which they have not heretofore touched to any extent. This valuable report should be followed by the establishment of British commercial agencies in Canada, reporting to a common centre in this country, and keeping British firms in touch with every fresh movement as the wideawake American consuls do.

OPENING FOR CANADIAN PULP IN FRANCE.

The Dominion Government having secured from the French Government Customs permission to let Canadian mechanical pulp enter the French market free of perforation, this opens another market for our Canadian pulp. It will perhaps surprise some of our readers to learn that during the last three years no less than 17,500 tons per annum has been sold from two Canadian factories. Canada should sell to France twice as much as this from now on. We believe it would be profitable if the Canadian Government would arrange its subsidies to the new steamer service to France, so that the rates on wet pulp should be as low as possible, and on the same basis, for instance, as those charged to England. France is a buyer of pulp to the extent of over 200,000 tons annually, and the market is capable of very great development. We trust that something more will be done in this direction.

CONDITIONS HAVE CHANGED.

Not so very long ago the big American mills were bitterly opposed to any plan for abrogating or reducing the duty imposed by the Washington Government on Canadian pulp. Things have worked out differently since, and time has had its revenge. The very interests which saw danger in the free access of Canadian pulp to the American market are now the ones which see in that the only salvation for the American paper industry. From the Canadian point of view one thing can be said, that is, that should pulp from this country be admitted free into the United States, the time will come when Canada's supreme economic superiority for the manufacture of paper will be speedily recognied. There is no reason why Canada should not be the greatest paper manufacturing country on earth, and the manufacture of pulp on a much more extended scale, which would, no doubt, result from its free admission into the United States, would be an important factor in bringing about this condition. There is this view to counterbalance the possibility, that by taking down the bars against Canadian pulp, the destruction of our forest wealth would go on more swiftly than ever.

RECIPROCITY.

G. D. Campbell, of the Campbell Lumber Company, Limited, Weymouth, N.S., submitted to the Nova Scotia Lumbermen's Association recently a paper in which he argued the folly of Canada giving its raw lumber and other materials free to the United States without insisting in return upon fair play for our own products. Canada, he said, should reciprocate tariff for tariff. A cord of wood is equal to a ton of pulp. The duty on this ground wood is $1.66⅔, while the wood is free, because the Americans are fast acquiring our available stumpage, and buying the rest by the cord, at a minimum price. According to Mr. Campbell, "the only sane and reciprocal" solution of this waste of Canadian resources, and raw material, for the benefit of the United States' manufacturers is to put an export duty on the raw material, or pulpwood equivalent. Give them the "reciprocity of tariff" is the only way we can control it, that is, by export duty, on the raw material at $1.66 per cord,

equivalent to $1.66 per ton that they impose for the wood manufacture into pulp per dry ton, or say—$2 per thousand on hemlock lumber they impose against us, the only country which supplies such material to them. and any man familiar with the lumber trade knows, that $2 per thousand on hemlock, is a heavier tax than $1.66 per cord on the spruce wood.

He suggested that a resolution be passed along these lines, with a proviso that the export duty on lumber and pulpwood be reduced in just the same proportion that they reduce their duties.

THE POWER FACTOR.

In speaking of the high price of pulp, and of the causes for the same, the high cost of labor and the lesser accessibility of sources of supply are not the only factors. There is another cause, the increasing value of power. A prominent manufacturer, referring to this point, says that in the earlier days when a mill was established and there came a period of depression in prices and close figuring, the power side was practically left out of the question. The dam was built and the money invested therein could not be got back so the manufacturer was content to let the mill go on grinding or turning out paper, providing there was a profit on the labor and raw material entering into his product. To-day the situation is entirely different. Power is no longer locked up on the bank of some stream at a distance from population. By the use of transmission wires power has become a merchantable article, like coal, to be sold at a distance from the point of production. Besides this, all the little towns were bidders for power, so were manufacturers of other lines of goods than those usually manufactured along streams, and the extension of electric railway lines throughout the country had created a strong demand for hydro-electric power. Thus a manufacturer who had a valuable power was no longer forced to keep his mills running in order to make any profit, but he could sell that power and leave his mills idle. Power has been, in many cases, given away in the past by manufacturers in order to sell their goods, but hereafter power must be reckoned in the cost of the finished article, just as is labor, or coal, or raw material.

—W. H. Rowley, manager of the E. B. Eddy Company, Hull, states it as his opinion that Canadian spruce is far ahead of that of any other country for making pulp. It makes, he says, the strongest, most fibrous, and feathery wood pulp obtainable anywhere, far superior to that of Scandinavia, Russia, Austria, Finland, or to what remains in the United States. Canada has over 2,500,000 square miles (over 1,655,000,000 acres) of green timber, very largely spruce and pine, and there is besides a great deal of hardwood.

—The 4th annual banquet of the employees of the Waterous Engine Works Company, Brantford, Ont., was another evidence of the cordial relationship existing between the firm and its men. The chair was taken by T. H. Preston, M.P.P. The proceedings were very enjoyable, being enlivened by vocal and instrumental music. An interesting announcement was made by Mr. Waterous, the president of the firm, to the effect that the firm would make every effort to furnish all its men with steady employment without any reduction in wages, even though it had to make concessions, within reasonable bounds, in securing contracts in order to provide work.

PULP AND PAPER NEWS

Sir William C. Van Horne, president of the Laurentide Paper Company, has sailed for Europe.

* * * *

Lecourier Printing Company, Ltd., have been incorporated with a share capital of $10,000; they will print and circulate newspapers.

* * * *

The Wilson Carbon Paper Company, Ltd., Montreal, capital $20,000, has been incorporated. They will manufacture and deal in typewriters, stationery and office supplies.

* * * *

B. Plow & Company, Ltd., Montreal, have been incorporated with a capital of $20,000 to carry on business as manufacturing stationers, print papers, make stationery, etc.

* * * *

The city of Peterborough, Ont., is applying to Parliament for authority to confirm a by-law to aid the William Hamilton Manufacturing Company, Ltd., by a loan of $30,000, a fixed assessment of $10,000 for ten years and other concessions.

* * * *

It is understood in Portsmouth, N.H., that some Canadians are negotiating for the lease of the Publishers' Paper plant at that place for a term of years. The parties in question have a large tract of spruce limits, and the idea is to ship pulp-wood from this area to Portsmouth. We cannot learn the names of those interested.

The St. Lawrence Lumber and Industrial Company, Sherbrooke, Que., reference to which was made in last number as having been recently incorporated has secured 500 square miles of valuable limits situate along the Bersmis River, north of the St. Lawrence. The purchase price is said to have been in the neighborhood of $100,000, and the property will be explored by experts as soon as possible. The following have been elected officers of the company:—President, B. C. Howard, Sherbrooke, Que.; vice-president, C. W. Mullen, of Bangor, Me.; treasurer, R. E. Ewing, Sherbrooke; and secretary, Chenier Picard.

* *

The British Canadian Wood Pulp and Paper Company is making arrangements for installing machinery at its mill at Howe Sound, B.C., immediately, Col. Tracy and his party of surveyors having finished their inspection of plans, and preparation for buildings, etc. The property lies on an old land grant originally given to Geo. Cates about 25 years ago, and is situate on Thornborough Channel opposite Gambier Island, only a few hours' run from Vancouver. Water, of which 1,500,000 gallons will be required, will be run by gravity direct into the mill. Work is being hastened to get the first unit of the plant in operation as soon as possible, which is expected to be within four months.

NEWS OF THE MILLS

J. R. Booth is selling considerable paper in Washington and the North-West States.

* * *

We regret to announce that Christopher Fisher, head of Fisher & Sons, paper manufacturers, Dundas, Ont., died last week at his home in Dundas. Some months ago he was attacked with gangrene, and with the hope of saving his life his leg was amputated. His condition rapidly became worse, however. The deceased was about 50 years of age.

* * * *

While attempting to operate the slash boards of the gates at the head of the spillway on the hydraulic race, David Leith, an empliyee of the Kinleith Paper

Mills, St. Catharines, Ont., slipped on an icy board and fell into the water, where his clothing caught on projecting hooks. This saved his life, as otherwise Leith would have made the descent of the spillway and his life would have been dashed out against the heavy timber at the bottom

* * *

As a step to the leasing of the Menzie Wall Paper Company's plant in New Toronto to the Reg. N. Boxer Company, Limited, Montreal, the Menzie Company is, we understand, winding up its affairs under the Ontario Act, providing for voluntary liquidation. The liquidator is Thos. W. Horn, Toronto. The company has ample assets to cover all liabilities and protect shareholders. The mill is now being remodelled under direction of the Reg. N. Boxer Company, and equipped with an up-to-date plant for the manufacture of high-grade paper, making a specialty of English and foreign designs.

CANADIAN FORESTRY ASSOCIATION

The annual meeting of the Canadian Forestry Association was held in the Board of Trade Hall, Montreal, on the 12th and 13th inst.

H. M. Price, the president, occupied the chair, and the attendance was large. There were present on the platform at the opening, His Grace Archbishop Bruchesi and Monseigneur Laflamme, and Lieutenant-Governor Jette.

His Honor welcomed the Association and in his address laid stress on the need of popular education on this, the most important problem affecting the material interests of the country.

In his address Archbishop Bruchesi urged the need of forest conservation in the interests of future generations and spoke of some interesting experiments carried out by the clergy near the monastery at Oka where out of 65,000 trees planted out only 5,000 failed to grow.

Hon. Sydney Fisher addressed the Convention and uttered a warning as to the consequences that would attend the wasteful and unscientific methods now in vogue of treating the forests of Canada. His announcement that the Dominion Government had set aside as a new forest reserve the whole eastern slope of the Rocky Mountains, was greeted with applause. He urged that reforestation should be carried on among the hills from which flowed the tributary streams and rivers emptying into the St. Lawrence, both on the north and south sides. He showed how the business men as well as farmers were interested in forest conservation, for without forests we would have an uncertain rainfall, and fluctuating flow of water in the rivers to the damage of our water-powers. He hoped the question of forestry would be kept out of politics. With regard to a duty on the export of pulpwood he was at first disposed to favor such a step, but on further consideration it seemed that every argument that could be advanced in the case of wood could also be advanced in the case of pulp, and he thought the policy of this country should be directed to developing the manufacture of the finished product—paper. He did not see any reason why this country should not become the greatest paper-making country in the world.

The report of the board of directors was as follows:—

The following vice-presidents for the Provinces were appointed:—Ontario, Hon. Frank Cochrane; Quebec, Hon. A. Turgeon; New Brunswick, Hon. F. J. Sweeney; Nova Scotia, Hon. A. Drysdale; Prince Edward Island, Rev. A. E. Burke; Manitoba, Hon. J. H. Agney; Saskatchewan, His Honor A. E. Forget; Alberta, Wm. Pearce; British Columbia, Hon. H. Bostock; Keewatin, His Honor the Lieutenant-Governor of Manitoba;

MacKenzie, F. D. Wilson; Ungava, His Honor Sir Henry Joly de Lotbiniere; Yukon, the Commissioner.

The membership of the Association as reported at the last annual meeting was 1,222, and has now increased to 1,282. Special efforts were made during the past year to increase the membership by the sending out of circulars and a considerable addition was made, but a number of names had to be dropped from the list owing to subscriptions being unpaid for several years.

The receipts for the year were $3,531.04, including a balance of $899.04 from the previous year, and also grants from the Ontario Government of $300; from the Quebec Government of $200; and from the British Columbia Government of $100. The total grant from the Dominion Government is $2,000 but the full amount has not yet been paid. The expenditure is $1,423.99, leaving a balance of $2,107.05. The thanks of the Association are due to the Governments who have so generously aided their work. The balance now on hand is $1,405.92.

The "Forestry Journal" has been issued quarterly with J. M. Macoun as editor. "The Journal" furnishes a great deal of useful information in regard to forestry to the members of the Association, and fills a useful place in this respect. The question of issuing a monthly journal was considered by the Board, but it was decided that the public could better be reached and educated by the preparation of special items for the newspapers and the issue of bulletins. These short bulletins have already been sent to the newspapers and others are in preparation. These bulletins have appeared in papers all over the Dominion, and are thus reaching a much larger circle than could be reached by the "Forestry Journal."

The most outstanding, forward step made in the Forestry movement in Canada during the past year was the establishment of a School of Forestry at the University of Toronto, under the principalship of Dr. B. E. Fernow. Dr. Fernow is one of the best known figures in the history of Forestry in the United States, and the work of himself and his school in Canada will be watched with sympathetic interest by all those interested in Canadian Forestry. The Dominion Government has added to the staff several trained Foresters, most prominent among whom is A. Knechtel, formerly the Forester of the New York Forest, Fish and Game Commission, who has had a large experience in the practical work of reforestation with that Commission. The timber survey was carried on by the Forestry Branch during the past summer on the Riding Mountain Forest Reserve, and it is expected will be completed this year. The survey will also be extended to other reserves. The distribution of trees for planting on the farms of the prairies is being continued steadily, an average of 2,000,000 per year being now maintained with the prospect that the product of the nursery will soon be considerably increased.

In the Province of Quebec the two Foresters trained in the Yale Forest School are conducting an examination of different parts of the Province and are beginning some practical work of reforestation. The University of New Brunswick is planning the establishment of a Forestry course.

Among the papers read at the Convention were the following:—"La Maniere dont quelques Cultivateurs usent du bois de leurs terres," by Monseigneur, J. U. K. Laflamme, Dean of the Faculty of Arts, University of Laval. "Compulsory Timber Reserves on Settlers' Lots," by E. G. Joly de Lotbiniere "Forest Survey Methods," by A. H. D. Ross, Lecturer in Forestry, University of Toronto. "Forest Lands and Agriculture," an illustrated lecture, by Professor Filibert Roth, Principal of the Faculty of Forestry, University of Michigan. "The Lumberman and the Forest," by E. Stewart, formerly Dominion Superintendent of Forestry. "Conservative Lumbering in Quebec," by C. G. Piche, Forester to the Department of Crown Lands, Province of

Quebec. "Practical Forestry in Eastern Canada," by R. R. Bradley, Forester to the Miramichi Lumber Company, Miramichi, N.B.

A summary of some of these papers will be given in our next issue.

ADDRESS OF HERBERT M. PRICE,*

President of the Canadian Forestry Association

First of all I must congratulate our Association on the fact that the annual meeting is held in Montreal, as it is now some twenty-six years since the last (and at that time the first) meeting was held here by the American Forestry Association. This city is capable, with its great influence, in being almost a determining factor in movements in this Province tending towards the good of our forest and water powers. I must mention that the desire of the directors of the Association to come into closer touch with, get expression of opinion from, and increase the interest of our French-Canadian friends, had much to do with the decision to hold the meeting here, as Toronto was anxious for the meeting to be held there.

We all hope that the two languages will be jointly used in papers and discussions, as in this way only a permanent interest can be worked up and a knowledge of the objects of the Association made widely known. We must reach the people in the country, and it can only be done by popularizing the subject, and we are now using articles for publication and for translation into the French press. I trust that the Association will this year publish in English and French, as suggested by Monseigneur Laflame, the annual report, which will include a full account of this meeting.

It is most encouraging to see His Excellency the Governor-General and our Premier, Sir Wilfrid Laurier, leading the Forestry forces of progress in this country and taking such a deep interest in everything appertaining to the subject and, at the same time, the President of the great and friendly nation to the south of us working on similar lines,

It appears to me that there is much to be done in this country as regards the people getting fuller information as to our true resources in the way of timber and wood generally and, although I know that all these statements must be estimates, yet a beginning should be made, and I think that a report from the Forestry Branch of the Interior Department somewhat on the lines of the publications issued by the Forest Service of the United States, such as "Forest Products of the United States," "The Use Book," etc., would be invaluable.

There is a great want of a more thorough exploration of the timber to the North, not only of this Province but of Ontario, and the Dominion Government might explore the northern parts of Manitoba, Alberta, and Saskatchewan, as our knowledge is very limited and, if it were ampler, it would be invaluable. The publication, "Canada's Fertile Northland," with the useful maps annexed, issued last year by the Railway and Swamp Lands Branch, Department of the Interior, giving, as it states, a glimpse of the enormous resources of a part of the unexplored regions of the Dominion, is a valuable contribution to what information we have on this subject.

As regards Canada's legislative action on such questions as export duty, etc., statistics should be issued annually as regards the cut and consumption of wood in Canada.

It has been suggested that a desirable means of encouraging the objects our Association have in view would be to establish branch associations in the different Provinces, and then have them affiliated with the parent one. I would, therefore, ask those of our members who reside outside the Province of Quebec and Ontario if they would take up this question without delay. Perhaps, as the parent society is at Ottawa, it would not necessitate branches in the Provinces of Quebec and Ontario. The

*Read at the Convention in Montreal, March 12th and 13th, 1908. For report of meeting see page 72.

parent association would thus be in constant touch with the sentiment throughout the whole Dominion.

It is satisfactory to learn that Newfoundland has a Forestry Association well under way.

I would call attention to a condition in the regulation re licenses and permits to cut on Dominion lands in Manitoba, Saskatchewan, Alberta, the North-West Territories, and within twenty miles on either side of the C.P.R., in the Province of British Columbia, that the licensee shall keep in operation for at least six months in each year a saw-mill capable of cutting 1,000 feet in every twenty-four hours for every 2½ square miles under license. This is, in my opinion, an undesirable condition and tends in the contrary direction to an enlightened forestry policy. Better to raise the annual ground rent and spend more on fire protection in the northern parts of the above mentioned territories than to make cutting compulsory; the timber is going fast enough.

My attention has been called to the large shipments of small spruce trees from the Province of Quebec, particularly in the Sherbrooke district, to the United States for Christmas trees. They run from three to eight feet in height, and sell for from 10 to 25 cents in Canada. This trade should be prohibited, as it has assumed large proportions, trees growing as far south as Pennsylvania. It appears that the Commissioner for New York State Forest Game and Fish Commission has drawn the public attention to the grave consequences that must result from this great destruction in New York State.

Canada has immense areas and, in proportion, a smaller number of men to protect same against fire, compared to the United States, although of late years more active measures have been taken against this enemy of our forests by all the Provinces.

I think it right to say something on the much discussed question of an export duty on pulp-wood, which, of late, has been brought prominently to the front by President Roosevelt's proposal to take the duty off wood pulp in return for free pulp-wood from Canada. I believe this proposal might justly be made more favorable to Canada by lowering the duties on paper, as the freight on wood pulp is always a serious factor in its shipment.

That an arrangement in this direction is more desirable than an export duty on pulp-wood I strongly believe, having advocated at our Ottawa Convention in January, 1906, a policy of reciprocity as opposed to one of reprisal, and I have no doubt but that Canada will get a fair " quid pro quo " for her supply of pulp-wood. The progress made by Canada the last six or seven years in the pulp and paper trades has been in a greater ratio than that made by the United States. In connection with this export duty I may mention that the last report of the American Forestry Service states that the average estimate of length of supply of pulp-wood given by 164 mills was 21 years, and Mr. Gifford Pinchot last year estimated the timber supply of the United States would last, at present rate of cutting, from twenty to twenty-five years.

If we had careful estimates made in Canada, by our Forestry Department, and information given by Provinces, as is given in the official publication, " Forest Products of the United States," we would get at an approximate estimate of our production and supply.

The directors of the association have decided that it is not expedient that any resolution shall be accepted on this subject at this meeting lest it might have a political complexion, and as the subject is one on which strong differences of opinion exist, it is very probable that the report of the Royal Commission will be acceptable to the country as a solution of the question.

It is very encouraging to see the principles the Forestry Association advocate being generally put in practice throughout this continent, and I note that, in his last message to Congress, President Roosevelt, who is a strong friend of

Forestry, recommended the establishment of the Appalachian and White Mountain Reserves. This question of reserves is now generally recognized by all the Provinces of the Dominion, and they are annually gradually increasing such areas.

The Government of the Province of New Brunswick held a very successful Forestry meeting at Fredericton in February of last year, a full report of which they have issued, and it was generally admitted that it had the beneficial effect of spreading much information and creating many friends to the principles we advocate.

The good effects of the meeting of this association in British Columbia, at Vancouver, in September, 1906, have been apparent in the increased precautions taken against fire, which that Province was much in need of, and the live interest now taken in the subject of Forestry generally in British Columbia.

I feel that it is not out of place on my part to suggest that the Federal and Provincial Governments procure and publish accurate reports on the water powers and also the water storage facilities of this country.

The storage question will at no distant date be one of vital importance to Canada, as it has now become in the United States, and was brought prominently before the Association by Mr. Cecil B. Smith, in his address at the Ottawa Convention in 1906, who issued a note of warning, especially as electric roads run by water power can supplant steam and so prevent fires.

Storage means much to forest, animal and fish life and, to quote an expression: "And it is coming, because it will pay."

This association is now eight years old, and our membership stands at about 1,200, but I trust that before this meeting terminates many new names will be added. I would ask every member to aid the work of the association by handing in the name of a new member within a short time of this appeal reaching him, and request them to aid the work of our quarterly journal by contributions of interest on Forestry and kindred questions, for our object is to make this journal one of general interest and not purely academical.

This association is greatly indebted to the Dominion Government, as well as to the Governments of the Provinces of Quebec, Ontario, and British Columbia for the grants made by them towards aiding the work of the Association.

I have no doubt but that Mr. Campbell will give us useful information on the great work being done in the North-West Territories by the Federal Government in the way of tree planting.

The Federal and Provincial Governments and all the legislative bodies of the Dominion are united on the preservation of the forests and the necessity for preserving the sources of our water powers and the ground is, therefore, ready for the seed that this association is endeavoring to sow.

As regards some definite national policy to be advocated by this association, I think that outlined by Sir Wilfrid Laurier in his address at the Ottawa Convention in January, two years since, is the most definite and practical. It was that all the hills, mountains, and plateaus, which are the sources of flowing streams and rivers should never be allowed, for any consideration whatever, to remain anything else than forest. That these portions of the earth's surface should form part of the national domain and belong to the State, which includes Federal and Provincial Governments. That, where such portions of these watersheds have been alienated and transferred to private ownership, the policy should be to repurchase them for the national domain.

—Hitherto sulphur coloring matters have not been employed for dyeing paper owing to the fact that sodium sulphide must be added to the pulp in the hollander in order to dissolve the sulphur dye. The objection to the sodium sulphide is that it decomposes the aluminium sulphate added for sizing the paper. A further difficulty is presented by the presence of sodium sulphide, or sulphuretted hydrogen, in the waste.

THE CLAYTON BEADLE COLLECTION OF WATER-MARKED PAPERS

This collection contains about 2,500 papers bearing watermarks, and spread

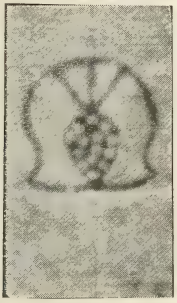


Fig. 1, No. 96.

over a period of between 500 and 600 years. It is perhaps the most complete collection of original watermarked papers in existence.

To give some idea of the distribution of these different papers over different periods we give a number of authenticated papers out of the collection corresponding with each century.

Century.	No. of Papers.
14th	17
15th	58
16th	556
17th	490
18th	259
19th	188
Total	1,578

From the collection was selected upwards of 1,000 marks as being representative of the bulk which were photographically reproduced by Mr. H. C. Potter, who also prepared a catalogue. From among these photographic reproductions we were able to publish, with the consent of Mr. Beadle, a few of these marks.

It should be borne in mind that the great bulk of recorded copies of watermarks are mere tracings of the marks, they do not faithfully represent the marks themselves as they appear in the paper, nor do they reveal the texture of

Fig. 2, No. 138.

the paper as in the case of these photographs.

It should be noted that the papers in the above mentioned collection vary in color, substance; some of them are more or less soiled, discolored, and dirty at

Fig. 3, No. 169.

the fold. However, they are no less valuable from this point of view, because in many cases they form part of valuable documents, but the fact that the papers being of this nature renders it far more difficult for a photographer to produce anything like an artistic photograph, al-

though he may faithfully reproduce the texture.

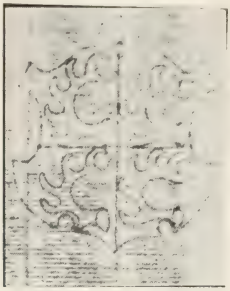


Fig. 4, No. 222.

Fig 1, Catalogue No. 96, is a Brunswick paper in existence A.D. 1559, representing the town of Augsburg.

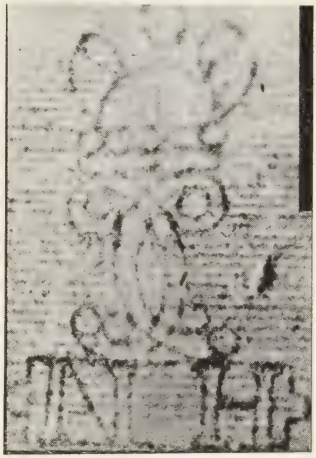


Fig. 5, No. 290.

Fig. 2 (138), is a Brunswick paper, found in the town of Bautzen, date, A.D. 1593.

Fig. 6, No. 347.

Fig. 3 (169), is a mark of the city of Breslau, dated ante A.D. 1550.

Some of the marks of early origin are extremely well executed, as an instance of this see Fig 4 (222), a Brunswick

Fig. 7, No. 477.

mark, said to represent the arms of Blankenburg Reinstein, A.D. 1638.

Fig. 5 (290) is a mark of the Grand Duke Carl, in a paper found in Berlin in A.D. 1767.

The horse and pillar is often met with in the old Brunswick marks during the 16th century. Fig. 6 (347) is a mark of this description, A.D. 1595.

Fig. 7 (477) representing the arms of Danzig, found in A.D. 1562, is a good mark on a well-formed sheet of paper.

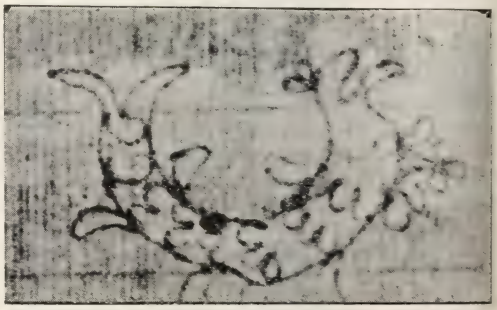


Fig. 8, No. 478.

The Dolphin marks, of which there are ten in the collection, between the years 1555 and 1600, are some of them very neat, although the majority of them are very small.

Fig. 8, No. 478, was found in a Brunswick paper of the year A.D. 1563.

There are a large number of unicorn marks of Brunswick, Amsterdam, Nur-

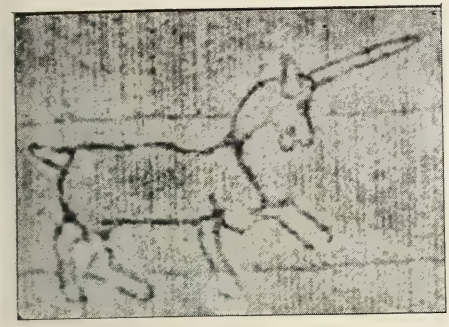


Fig. 9, No. 551.

emburg and Paris between the years 1414 and 1828. Fig. 9 (551) is a Brunswick mark of the year A.D. 1551.

There are a large number of marks of angels. Fig. 10 (592), represents a flying

Fig. 10, No. 592.

angel holding a crowned "C," date A.D. 1779.

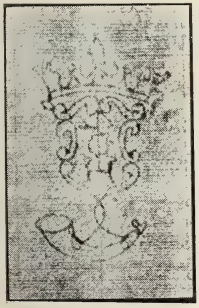


Fig. 11, No. 876.

Fig. 11 (876) is a neat little mark of the city of Nuremberg, consisting of the letters "C M" with a 4 above in a crowned shield surmounting a posthorn, of A.D. 1714.

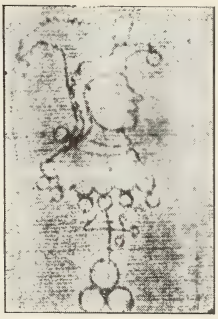


Fig. 12, No. 848.

Fig. 12 (848) is the well-known mark of a fool with cap and bells, this was found in a Brunswick paper A.D. 1676.

This collection appears to be the largest and most valuable in the world, and should prove to be of great interest to antiquarians.

The following list will give an idea of some of the towns, villages, states and countries from where the papers bearing the watermarks were found or discovered (100 selected):

Allrich, a town near Nordhausen
Aschen
Amsterdam
Altorf
Aurich
Bremen
Berlin
Berge
Bergstadt
Blankenburg
Brunswick
Breslau
Basel
Berlin
Corinth
Copenhagen
Celle
Cologne
Denmark
Duran
Derenburg
Dresden
Dannenberg
Euchwald
Eutin
Eissenhitte
Florence
Flemsburg
Frankfort a/M
Greifswald
Gluckstadt
Geldern
Gifhorn
Golberg
Gottingen
Heldersheim
Hamburg
Hesse
Harlem
Helmstadt
Hildesheim
Hameln
Halle

Hinterpomern
Halleinsheim
Hesse
Halberstadt
Jena
Krakou
Konigstein
Konigsberg
Lemberg
Lauenburg
Lotzen
London
Leipzig
Luneberg
Lubeck
Marienheide
Michelstein
Mannheim
Magdeburg
Milan
Neuberg
Nuremburg
Neuchatel
Oldenburg
Osnabruck
Pomerania
Paris
Penig
Rotterdam
Ratzeburg
Rome
Rendsburg
Rehburg
Stargard in Pomerania
Strassburg
St. Petersburg
Salzewedel
Speier, or Speicher
Steinforde
Stolberg
Schlaien
Silesia
Shallberg
Stolp
Torgau
Ulm
Vienna
Verden
Wernigerode
Wolfenbuttel
Westphalia
Whittenburg
Weidelah, a village near
Zelle
Zurich

The following gives some idea of some of the towns, villages, states or countries designated by the watermarks (56 in number):

Amberg
Amsterdam
Anhalt
Asseberg
Augsburg
Aussig
Austria
Bautzen
Breslau
Brunswick
Basel
Blankenburg-Reinstein
Bernburg
Batabia
Domitz
Dresden
Frankfort a/M
Goslar
Hameln
Halberstadt
Hasserode
Hanover
Hesse
Hildesheim
Kiauten
Kinsky
Lubeck
Luneberg
Mansfeld
Mecklenburg
Minden
Hannover-Munden
Netherlands
Nordhausen
Nordheim
Noremburg
Oker
Ols
Osnabruck
Osterode
Quedlinburg
Regenborg
Reinerz
Saxony
Schleinitz
Stolberg
Stolpe
Strassburg
Troyes (France)
Westphalia
Wernigerode
Walsrode
Walsleben.
Ysenburg

PROF. FERNOW ON CANADA'S FOREST PROBLEMS

The following are a few of the home truths presented by Prof. B. E. Fernow, Dean of Forestry at Toronto University, at an address delivered by him before the Canadian Club of that city:

It was just about a quarter of a century ago that the first efforts were made in Canada by some patriots to bring about a more conservative use of your timber resources, namely, when in 1882 the first American Forestry Congress met at Montreal. But the results of this movement have been small, indeed, and you are still going on destroying and frittering away your richest resource. This, I consider, can only be due to ignorance as to the value, and as to the meaning of your forests to the future of your country.

Are you aware that Canada is destined to have a population of ten times the present in less time than it takes to grow a sawlog?

Are you aware that the amount of log timber standing on your remaining timber domain, large as it appears when compared with present consumption, is small, very small, when the possibilities of the future, and the increasing demand for both land and timber are considered?

Are you aware that your neighbor to the south has not 30 years' of log supply in sight to meet his increasing needs, and that soon, nay that now, the clamor for free admission of Canadian supplies will start such an activity in your woods as was never dreamt of?

Are you aware that, accepting the

highest estimate of your commercial log timber standing as likely correct, the present sawmill capacity of the United States could exhaust it in less than 15 years?

Are you aware that there is no other source than the Canadian supplies to draw on for the class of wood that satisfies our requirements, for all the export countries of northern-grown woods find now all at once their timber resources near exhaustion, and are curtailing their cut and export; and you should realize that the tropical woods are not serviceable.

Are you aware that, therefore, Canada has in its timber wealth an asset which will be worth infinitely more if husbanded and left to future use, than if the money derived from its present sale were placed on compound interest for the same length of time? For prices of wood materials have not only grown in the past, but will grow in the future much more rapidly than those for any other materials, as it becomes known that the forests of the temperate zone where the industrial nations live, are nearing exhaustion.

Are you aware that the consumption of wood in all industrial nations has grown during the last two decades at a compound rate of 3 to 5 per cent. per capita per annum, and hence the decimation of timber is going on in the world at a geometric ratio?

Again, are you aware that aside from the material value and direct use of your timber resources, there attaches to the forest, merely as a surface condition of the soil, an indirect value which in some localities is of much more importance than the wood material it furnishes?

Great talk about the splendid water powers that are to make Canada's great future is now the order of the day. At the same time you do all you can with axe and fire to impair this wonderful resource. For, equable water flow, which is an essential condition for developing effective water-powers, is not to be had without preservation of forest cover along the streams.

NEW QUANTITATIVE TEST.

Cross, Bevan & Briggs, London, analysts, communicated to the Conference of Cellulose and Paper Mill Chemists, recently held in Berlin, a new method which they have devised for the accurate estimation of the percentage of mechanical wood pulp in papers.

This method is based on a process which these chemists have discovered, whereby phloroglucin may be quantitatively determined in dilute hydrochloric acid solutions by volumetric titration with formaldehyde solution. We shall omit the details of the operation, which, though quite easy for those who have chemical experience and a laboratory at their disposal, is hardly suitable for the ordinary office.

The following notes are taken from the report of the Conference in the Papier Zeitung: Every one knows that lignified materials, such as mechanical wood pulp, give a red coloration with acid solution of phloroglucin, and therefore must enter into chemical combination with that substance. If, therefore, a weighed quantity of rasped wood be placed in a measured quantity of phloroglucin solution of which the exact phloroglucin strength has been previously determined, some of the phloroglucin will be withdrawn from the liquid and fixed on the fibre. By the new method of titration with formalde- and deal in twpewriters, stationery and hyde, the quantity of phloroglucin in the liquid can be accurately ascertained before and after the immersion of the fibre, and thus a chemical constant, called the "phloroglucin absorption value" is readily established for any given fibre.

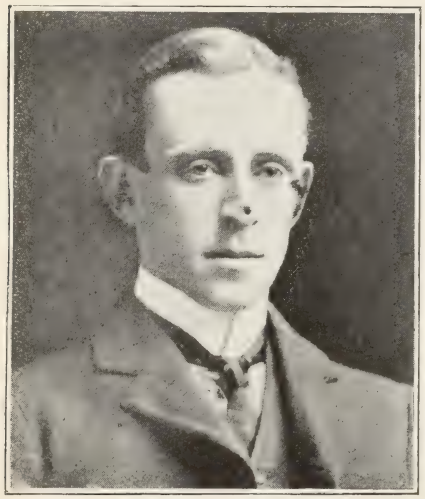
It has been proved that all samples of ordinary "white" mechanical pulp possess approximately the same phloroglucin absorption value, they combine with just about 8 per cent. of their weight of phloroglucin. Similarly all samples of fully boiled sulphite wood cellulose, whether bleached or unbleached, possess about the same phloroglucin value, but in this case, owing to the removal of the lignin, the number is very

much less; only 1 per cent. of their weight. So that if the phloroglucin value of any paper containing mechanical and sulphite pulp be determined, it is easy to calculate how much of each constituent is present.

The chemists of an English paper mill undertook the preparation of nine samples of paper of known composition ranging, at intervals of 10 per cent., from 90 down to 10 per cent. of mechanical wood, and these papers were analyzed by this method. The results showed that the accuracy of the process is reliable, with variations of 1 to 2 per cent. from the actual proportions used. When papers containing size and mineral loading are dealt with, the rosin may either be extracted or allowed for, whilst the mineral is estimated and deducted from the weight of the paper. Thus all the results are expressed in terms of the fibrous constituents of the papers only.

CARL RIORDON.

Carl Riordon, chairman of the Pulp and Paper Section of the Canadian



Carl Riordon.

Manufacturers' Association, and general manager of the Riordon Paper Mills, Limited, has inherited the good business instincts of his father, the founder of the Riordon mills. Mr. Riordon was born at St. Catharines, Ont., in 1876, and thus at the early age of 32 he finds himself the president of what is in effect the Pulp and Paper Manufacturers' Association of Canada, as this branch of the Canadian Manufacturers' Association numbers in its membership practically all the pulp and paper mills of the Dominion. He is also the executive head of the large mills near St. Catharines, and those at Hawkesbury, Ontario. Shortly after graduating as a B.A. at Toronto University in 1896, Mr. Riordon entered the mill, of which he soon became manager, and has acquired a practical knowledge of every phase of the conditions of this important industry. Because of this knowledge, and a broad grasp of public questions affecting the pulp and paper industry he has been chosen as presiding officer of the Association at the most important epoch in the history of the trade.

CHLORINE BLEACHING.

A writer in the Wochenblatt fur Papierfabrikation says that as a rule the development of the chlorine from the bleaching fluid is either left to the influence of the carbonic acid in the atmosphere or is effected by the use of stronger acids. The use of the latter has, however, the disadvantage of their combining with the previously dissolved lime in the form of insoluble combinations, which can scarcely be washed out of the fibres. Still, the use of sulphuric acid is preferred on account of its not being of such a volatile nature as muriatic and acetic acids, which are also used for the same purpose. The action of the carbonic acid in the air upon the solution of chloride of lime being very weak and gradual (not adapted to modern requirements), its use has been to a large extent abandoned, more powerful acids being employed which, on the other hand, are injurious in their effects. In the warm process the development of the chlorine must not be too much forced. In the cold process of bleaching, however, the employment of direct carbonic acid has even decided advantages in accelerating the progress of bleaching.

A FORESTRY ESTIMATE.

In giving the following estimates of the profits to be expected from scientific forestry during a long period, the Massachusetts expert who has drawn them up desires to be on the safe side rather than to draw an over-attractive picture. The rate of interest, the price of land, and the assessed valuation upon the increment growth are all variable and elastic factors for basing computations.

Profits from Woodland under present conditions in Massachusetts.

Term of forty years. Taxes and valuation figured at 4 per cent. compound interest. Average price of woodland free of growth estimated at $6 per acre. As the trees grow an additional $5 per acre every ten years is allowed as follows:

First ten years, $6; second ten years, $11; third ten years, $16; fourth ten years $21.

The average tax rate throughout the State is $17 per thousand.

Second growth white pine, chestnut, and sprout hardwood growth are those we are most familiar with.

(1) Sprout Hardwood Growth.

In sprout hardwood growth it is generally considered that a cord per year can be obtained in average conditions on an acre. Therefore forty years equals forty cords. Stumpage value $50 to $80, depending on locality and proximity to market.

Investment at End of Forty Years.

Compound interest of valuation $6 for forty years		$22 81
Taxes with interest—		
First ten years	$3 97	
Second ten years	4.48	
Third ten years	4.83	
Fourth ten years	4.29	
		17.57
Total cost		$40.38

Profit $10 to $40 in forty years per acre or 25 cents to $1 an acre per year.

(2) Chestnut Growth.

Can expect about 100 good telephone poles or 300 ties with 15 cords of wood, total net approximate value of $100. Investment at end of forty years same as for sprout hardwood growth $40. This leaves a net profit of $60 per acre in forty years, or $1.50 a year per acre average.

(3) Second Growth White Pine (Natural Reproduction).

From actual measurements this growth was found to yield on an acre 25 cords of white pine and 15 cords of hardwood. A cord in terms of lumber meaning a thousand board feet. White pine is worth $5 per cord and hardwood $1. Total 40 cords equals $1.40. Deducting $40, the investment which is the same as for sprout hardwood growth and chestnut, leaves a net return of $100 an acre in forty years or a net income of $2.50 a year per acre.

(4) Natural Pastures (So-Called)

There are in Massachusetts over 1,000,000 acres of pasture lands. Assuming that all cattle and sheep are pastured at the average rental, statistics show that these lands do not average $1.50 a year per acre. If from this sum we subtract $1 a year, the amount allowed for taxes on valuation, and compound interest on valuation, the same amount as allowed in the case of forestry lands, the net income for an acre per year is only 50 cents. This shows that there are thousands of acres of pasture lands in Massachusetts that rightfully and economically should be turned over to forestry.

Time was when this State was a great producer of grazing animals that were raised at a profit. Conditions now are vastly changed and if we have learned anything in scientific agriculture in recent times it is that concentration on smaller areas and a more definite rotation of crops make the successful farmer. This same logic and philosophy turn over acres upon acres of lands of our farms at present in an unproductive and unprofitable stage to an industry with not only great possibilities com-

mercially, but improving a condition at present greatly needed.

(5) White Pine Planted (Nursery Stock).

White pine seedlings at 6 x 6 feet require 1,210 per acre. Two-year seedlings are worth $5 per 1,000.

Compound interest on valuation $11 for forty years	$41..81
Compound interest 1,210 seedlings, at $5	$6.05
Compound interest transplanting 1,210 seedlings	4.95
Total	$11.00
$11 at interest for 40 years	$52.80
Taxes with interest—	
First ten years	$6.63
Second ten years	7.15
Third ten years	6.34
Fourth ten years	6.33
	26.45
Total cost	$121.06

Product at end of forty years 40 cords, or 40,000 B. M. feet at $5, equals $200, leaving a net profit of $78.94, or $1.97 a year per acre.

These figures are based upon the maximum cost of seedlings and planting, also the valuation of pasture land at $11 instead of waste lands, as considered under (1), (2) and (3) at $6.

(6) White Pine Planted (Home Grown or Native Seedlings).

Compound interest on valuation ($6) for forty years	$22.81
Initial outlay for seedlings and planting $5 per acre, plus interest for thirty years	29.00
Taxes with interest forty years	17.57
	$59.38

Returns at end of forty years, forty cords, or 40,000 B. M. feet at $5, equals $200. Subtracting cost, $69.38, leaves the net profits in forty years, $130.62, or an average of $3.26 a year per acre.

Reducing the whole to tabular form we have the following:

1. Under favorable natural conditions of reforestation; returns per acre in forty years and average an acre each year—

Growth—	Per Acre in 40 Years.	Aver. an Acre Each Year
Hardwood	$0.00 to $40	$0.00 to $1.00
Chestnut	60	1.50
Second growth white pine	100	2.50

From pasture land, valuation $11, average $0.50 an acre per year.

2. Where trees are planted; returns per acre in forty years and average return an acre each year:

White Pine	Per Acre in 40 Years	Average an Acre Each year
Valuation $11.		
Seedlings, planting	$70.00	$1.75
Valuation $6.		
Seedlings, planting, $5	130.62	3.26

From these calculations it is shown that even under present conditions forestry can be practised commercially with a reasonable profit. As a long time investment the returns must be considered as offering exceptional opportunities. The rate of interest under each example cited per year for the principle first used at the end of the forty year period is in each case as follows:

(1)	0 to 16%	(2) 25%	(3) 41%
(4)	4%	(5) 9%	(6) 29%

No matter how attractive we may make it the fact still remains that few people are willing to make long time investments and wait for their fruition. The time is coming, however, when far-sighted business men will recognize this source of investment as a safe and profitable one. The State of Massachusetts it is believed can well afford to make a beginning in this direction by purchasing at low cost much of our cheap lands, and restocking them as forest reserves. Not only can they be made a valuable asset in the future to the Commonwealth but to serve as examples of forestry methods.

THE QUESTION OF GLOSS.

Discussion on the use of glossy papers is translated from the German by the "American Printer":—

Those who are observant cannot fail to note the constant struggle towards perfection which is manifest not only in methods of reproduction, but in the manufacture of printing inks and printing papers. It is not only that the stress of competition is constantly forcing something "new" on the market simply because it is novel, but that there is a real impulse to produce something practical, to perfect each necessary quality, and to adapt products and processes to new requirements.

The gloss or high finish of art printing papers, which was at first considdered so very desirable, is not at present looked upon with such enthusiasm by those who are fully conversant with the matter. A most revolutionary effect in the manufacture of printing inks and printing papers resulted through the wonderful improvements which Levy made in methods of reproduction by means of screens. The very fine Levy screen, with its 175, 200, and even 300 dots to the square inch, produced printing plates whose fine half-tones made the greatest possible demands on paper and ink. Yes; even the presses themselves had to be built to meet the new requirements.

The fine qualities of coated papers required for half-tone work were first successfully made and used in America, and it is also to America that we owe the first suitable half-tone inks. In the manufacture of highly-finished coated papers less attention was given to proper absorption, such as would result from a perfectly even and well-adhering coating, than to high finish. This high finish was so exaggerated that we finally arrived at a veritable mirror-like surface, the extreme gloss of which is very unpleasant by daylight and still more disagreeable by artificial illumination. Hygienists who studied the situation soon warned us against the harmful effects which this gloss had upon the eye, while chemists and physicists placed on record their doubt as to the durability of such papers. Not only are the rays of light reflected by such paper harmful to the eye, but they cause inconvenience by making it necessary to hold the page in a certain definite position in order to make it legible. This is particularly true by lamp-light, where the printing sometimes actually twinkles unless it be held in exactly the right position. In the case of large solids, such as are found on illustrations, there is sometimes an iridescence around the edges, like a rainbow, in which red and blue are especially prominent. Though this phenomenon may disappear as soon as the page is held in the proper position, it is, nevertheless, extremely disagreeable. This occurrence is sometimes due to the quantity or quality of the varnish contained in the printing ink, in the

FOR SALE

One second hand revolving rag boiler, in first-class condition, driving gear and all complete, Dimensions : 6 feet diameter by 25 feet long, with 2 doors, working pressure 50 pounds per square inch. For price and further particulars apply to the Cornwall Paper Manufacturing Company, Mille Roches, One.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

POSITION WANTED.

Superintendent open for Engagement.

A1 on Book, Bond, Blottings and Coating Stock 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc. Address M. R. J. care Pulp and Paper Magazine, Toronto.

Position Wanted

A mill manager, having experience in the manufacture of Kraft Brown both in Sweden and England, is open for an engagement with a Canadian mill. Is able to take charge of a paper mill as manager or assistant manager. Address "Kraft," c/o Pulp and Paper Magazine.

endeavor to make the ink brilliant and glossy so as to be suitable to the highly finished paper.

Furthermore, these glossy coated papers are a great nuisance to the printer and bookbinder, because they are so easily creased, dented and soiled. The reader is equally annoyed, because it is impossible for him to make necessary corrections or notes on such a glossy, chalky surface.

These glossy papers were used for the majority of the better class of publications, and it is now well understood that many of the beautiful editions and periodicals published within the last few years, at an immense expenditure of time and work, will last but a short time. And it is most especially unfortunate that the artistic inspiration which has expressed itself in the illustrations and composition and the printing of such works, will not become a heritage of future generations. This is certainly very deplorable, and we would much rather have been deprived of the brilliancy and other supposedly desirable effects which fine printing on high gloss paper might posses. For publications where durability is not an object, and which have no permanent worth, such as catalogues, commercial printing, prospectuses, booklets, etc., such paper may continue in use without objection, as publications of this kind when once used have fulfilled their purpose. But for scientific works, high-class publications, illustrated editions de luxe, etc., high finish papers should certainly not come into consideration and use.

It is doubtless true that the high gloss obtained by means of hot calendering makes possible an extraordinarily clear and clean impression; that the delicate network of the modern half-tone prints on such paper so smoothly and softly in the finest half-tones that a delightful effect is produced. The most delicate portraits properly printed can be so graduated that they almost run into the tone of the paper, and the fullest development of the modern half-tone, when improved by retouching the positive, re-etching and tooling, is found when printed on these high gloss papers. Indeed, it is only by means of these papers that the astonishing perfection to which the half-tone has been brought in modern times can be properly demonstrated. It is, therefore, no doubt a difficult task to cast such papers aside, and it is just where we wish to attain the highest possibilities of the half-tone process that we would wish to continue to use such papers, as long as no good substitute can be found. To produce such a substitute must, therefore, be the highest ideal towards which the paper manufacturer should strive. True, there has been no lack of attempts to do this, but almost all papers placed on the market with this end in view have failed to do what they promised.

It is only in the very latest time that the right way seems to have been found, not only as regards paper, but ink as well, and that the latter plays a most important role will readily be seen. True enough it is that even previous to the use of coated paper, indeed, before coated papers were thought of for printing from plates in relief, there was a constant demand on the ink manufacturer for glossy inks. There was a demand for blacks which should not only be deep in color and rich in tone, but which should have a certain gloss. This gloss was considered very desirable, the idea being that it produced a greater contrast in illustrations. This may be true enough in some classes of work, as, for instance, catalogues and scientific publications, where, by having the ink brilliant and glossy, a great contrast would result between the black and white, but it was most decidedly a mistake to carry this idea into printing of artistic illustrations and the reproduction of drawings and paintings. From the purely technical standpoint of the printer, a landscape was considered well printed when all the solids were black and glossy, and the lights were consequently in great contrast, but from the artistic standpoint, this tech-

nically correct result failed to give the landscape its proper tone, because the gloss of the ink, especially in the case of blacks, made it very difficult to reproduce the proper artistic harmony.

The French, English, and American illustrations of the better grade have already preceded us in finding the right road. They soon discarded the idea of brilliant glossy inks, and attempted to obtain the proper effects by means of suitable underlays. How this is done in each individual case is, of course, dependent upon the color values of the original. I can very well remember the verdict of several German printers of those times, to whom I showed some high-class American publications, and especially those which were artistically valuable. They said: "Why, these are not properly printed. The solids are not underlaid enough." To-day we have changed our opinions, as demonsrated by the method now used to print our illustrations. How could the idea to print on dull-finish paper be gaining ground otherwise, when to do so shows marked progress in the ideas and perceptions of our craft. And here again the Americans have blazed the way.

Their efforts have been to produce dull finish papers suitable for printing fine screen half-tones. It was obviously impossible to return to coarse screens after the wonderful effects which fine screens made possible, but the old uncoated printing papers were not suitable for fine screen half-tones. It was, therefore, absolutely necessary to use coated paper, but the coating was made thinner, its composition was improved, and the gloss thereby avoided. These new papers have a soft and agreeable feel and a sympathetic texture.

It is true that experiments made with papers entirely uncoated gave satisfactory results with wood-cuts and line-cuts, but not with fine half-tones. The dots of the screen show up so strongly that the delicate middle tones come up almost solid, thus making it impossible to abandon the idea of coated paper. It may, perhaps, be possible for the progressive paper-maker at some future time to produce an uncoated paper which could be used for the finest half-tone work—that remains to be seen, and would be ideal if it could be accomplished."

PULP-WOOD IN CANADA.

The London Standard writes as follows on the dangers of depleting Canada's supplies of pulp-wood:—

The pulp and paper manufacturers who waited on the Dominion Government and asked that the export of pulp-wood should be prohibited have the support of the Canadian press in any movement which will prevent the depletion of the forest, and especially that particular part of the forest in which they are specially interested. The first suggestion was to place an export duty on pulp-wood. It was said that one dollar per cord of an export duty would be sufficient. The latest proposition is prohibition.

It has been said that Canada is "the granary of the Empire," and it might also be said that it is "the forest of the Empire." Statisticians admit their inability to estimate even approximately the amount of pulp-wood standing in the Dominion to-day, but agree that one billion cords is well within the mark, constituting the largest spruce forests in the world. The quality also is admitted by rivals to be the best. The enormous extent and value of this heritage are only beginning to be viewed in their proper proportions. Taking a billion cords as a basis, Canada is in a position to supply all the pulp-wood needed for this continent and Great Britain for at least a century or two, unless the demand increases at a much more rapid rate than it has done in the past. But, say the prohibitionists, why speak of a century or even two centuries of pulp-wood any more than a century's supply of wheat or of fish or any other product? In view of the fact that a spruce forest will reproduce itself under proper forestry regulations in thirty years, a paper

mill having to-day a million cords of standing pulp-wood, from seven inches up, can justly claim to have a perpetual supply of raw material for an output of one hundred tons of paper per day. Wilful waste is as great a wrong on the part of the millionaire as on the part of the pauper, and retribution is just as likely to follow in the one case as in the other. Canadians realize that they will be held strictly to account for the use or abuse of the resources placed at their disposal.

The United States, a few years ago, talked as freely of their vast supply of pulp-wood as does Canada to-day. But they failed to adopt proper forest regulations, with the result that to-day they find themselves depending on foreign countries for fully one-half of their annual supply of pulp-wood. Norway and Sweden have also failed to adopt precautionary measures, and there, also, what was once considered an inexhaustible store is now said to be only sufficient to maintain their present consumption for a decade or thereabouts. Germany alone has properly appreciated the situation, and Canada is asked to follow her footsteps as far as practicable. In Germany over 50 per cent. of the reproduction is done by artificial means and this is found to be most satisfactory. After the drop is produced there is still a chance of improving it by accelerating its development. It is possible to increase the production two or three fold by a proper use of the axe.

Canadian newspapers consume about 35,000 tons of paper per annum. About £400,000 worth of news paper is exported from Canada annually. There is more paper exported than there is consumed in the country. It is not likely that the home demand will ever devastate the land; it is the foreigner who will do that. At present the Canadian receives from Americans so much per cord for his pulp-wood, and the land becomes useless for anything else. To prohibit the export would compel the American to manufacture the pulp in Canada at an expenditure of about £6 per cord, or to erect paper mills in Canada.

SELLING CONDITIONS OF SWEDISH MANUFACTURERS.

Swedish paper manufacturers have adopted standard forms whereby paper and board are understood to be accepted by purchasers if their weights do not vary from those ordered to the extent of more than 4 per cent., with an extension of the margin to 8 per cent. in the case of very light or very heavy qualities. Deviations in size of not more than one-half per cent. are allowed. In strength a variation of 10 per cent. is permissible, while slight differences in shade, purity and strength do not justify refusal. Differences in quantities delivered on contracts are not to exceed 10 per cent. on orders for less than 10 tons, nor 5 per cent. on orders for larger quantities. Offers, sales and engagements as to delivery are dependent on accidents, strikes, lockouts or other unavoidable obstacles, delivery being extended in such cases. The place of manufacture is to be specified, so that troubles at that point relieve the manufacturer from the obligation of purchasing goods to deliver against his contracts. Complaints must be made within fourteen days and subject to the manufacturers having an opportunity of investigating them. Disputes are to be referred to arbitration, under the rules of the London Chamber of Commerce applicable to such cases.

—A striking evidence, not only of the enterprise of the Toronto Globe but of of the hold which the pulp and pulp-wood question is obtaining on the public mind, is shown in our contemporary's special number a couple of weeks ago, devoted to this subject. The articles were well written and well illustrated, and the whole work will have great value as an educative influence throughout the country.

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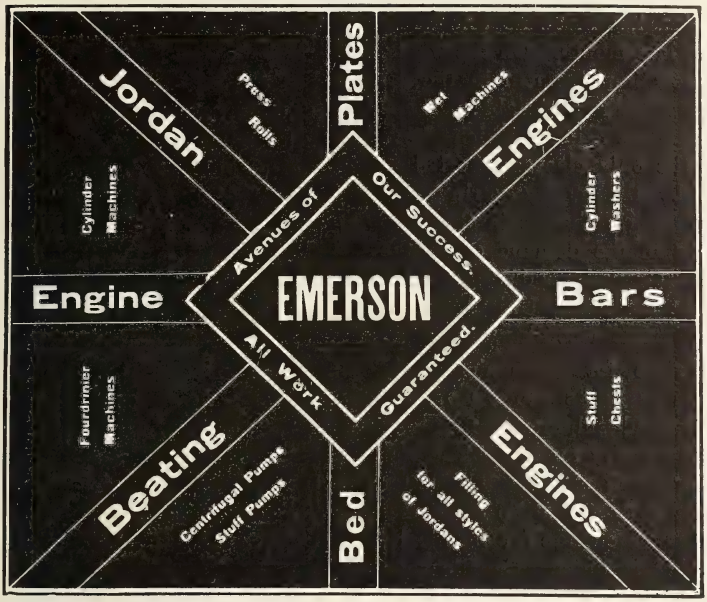

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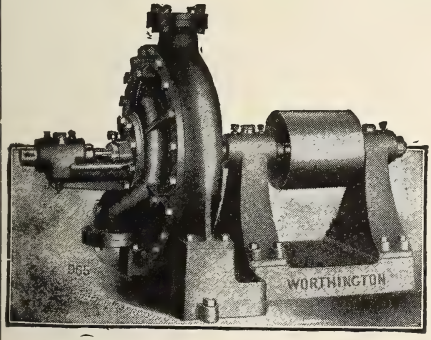

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For Pulp and Paper Mills.

Builders in Canada for "WORTHINGTON" TURBINE PUMPS, CONDENSERS, Etc. and New York Filter Co's. Pressure Filters.

THE MARKETS.

Toronto, March 14th, 1908.

The situation has made no very great change since last month. On the whole, there is a slow improvement in the demand for paper, more noticeable perhaps with book and writings, which have really been the only classes affected to any extent by the money stringency. There is not much change in the pulp market either in the demand or in the prices asked. Ground wood ranges from $21 to $25 at the mills, United States sulphite $2 to $2.50 according to quality.

British.—Prices for mechanical pulp continue firm at £3 5s., to £3 7s. 6d. Strong unbleached sulphite is firm and there is good enquiry for easy bleaching grades, under small stocks. The latter of first quality is quoted at £9 to £9 10s. There is not much change for chemicals, and the market is quiet. Caustic soda is £11 for 76-77 per cent., bleaching powder (soft) £4 5s. to £4 7s. 6d. Ammonia alkali, 58 per cent., £4 10s. to £4 15s.; recovered sulphur, £5 to £5 5s.

PAPER STOCK MARKET REPORTS.

Montreal, March 14th, 1908.

There is not much change in prices of paper stock. Quotations range about as follows:—

Unbleached cuttings	$4 00	to	$4 50
White shoe clips	4 50	to	5 00
Colored shoe clips	3 00	to	3 25
Domestic white rags	2 25	to	2 50
Blues and thirds	1 25	to	1 50
Roofing stock	85	to	95
Manilla rope	2 50	to	2 75
Waste papers	90	to	45
Bagging	85	to	90

TRADE INQUIRIES.

The following inquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these inquiries, with their addresses, can be obtained upon application to Superintendent of Commerial Agencies, Department of Trade and Commerce, Ottawa, or publishers "Pulp and Paper Magazine."

265. **Agency.**—A Scottish firm desires to secure the agency of a Canadian exporter of pulp-wood.

290. **Agency.**—A London firm, stated to have a connection among paper-makers in the United Kingdom, is desirous of taking up the agency of a Canadian exporter of wood pulp.

—J. F. Whitson, of the Ontario Surveys Department, read a paper before the Ontario Land Surveyors' Association last month, in which he gave some pertinent facts about that province's timber resources, their reckless destruction by fire, and the requirements of the future in the way of railway ties, etc. Canada's total railway mileage, he said, was 27,600 miles of track, in laying of which 83,000,000 ties had been used. The lifetime of a railway tie was seven years, and, therefore, to maintain the present mileage, meant a demand for about 12,000,000 ties a year. In Ontario there were at present 7,640 miles of track, meaning 23,000,000 ties, but in five years' time this would be increased to 9,000 miles, which would mean a demand for 4,000,000 ties a year, or from 26 to 32 million feet of timber, board measure. This was for Ontario alone, while this province would also be called on to supply a great proportion of the requirements of the West.

—The new pneumatic hoist and overhead track equipment of the Detroit Journal Company is being installed by the Northern Engineering Works, of Detroit, and will be used for handling paper, electrotypes, etc., and is similar in some respects to the one installed some time ago in the plant of the Detroit News, by the same firm.

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Boils off Water, not Spent Caustic.
Is easily kept clean.
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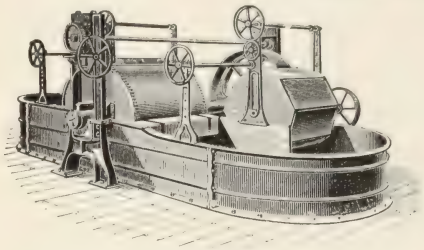

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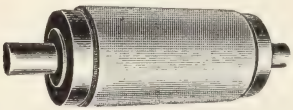
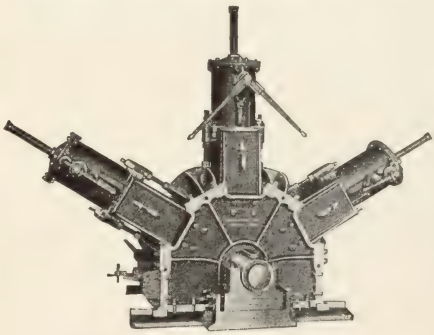


Cotton and Paper Rolls with Patent Fastenings.



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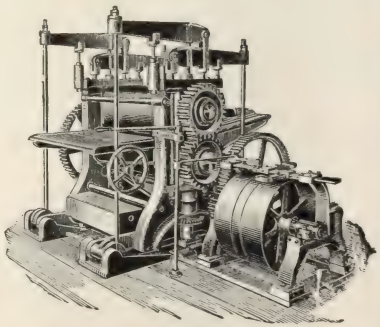

Description and Estimates Furnished; also Gear List and Catalogs sent on application.

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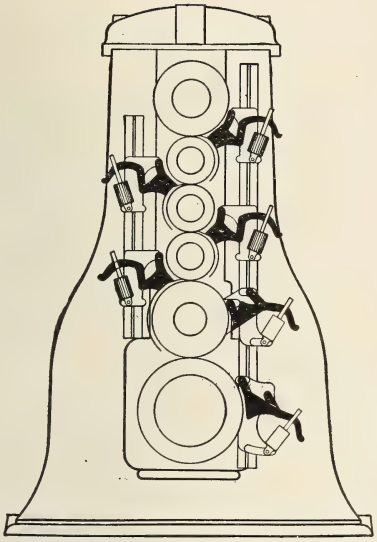

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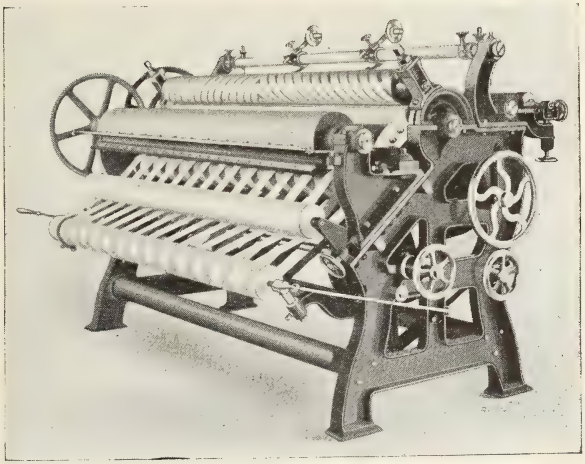

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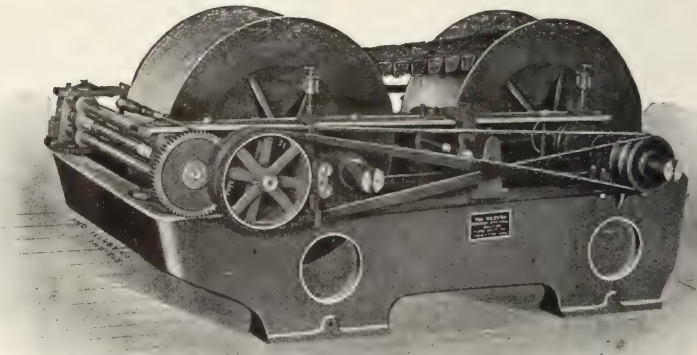

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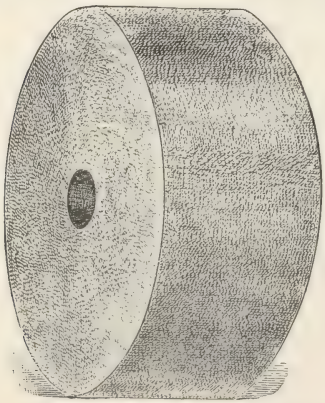

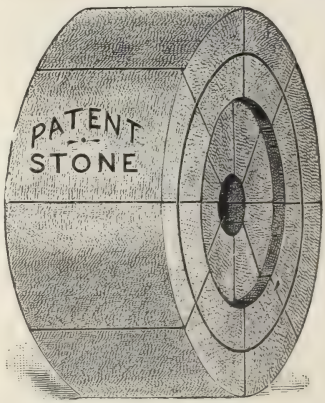

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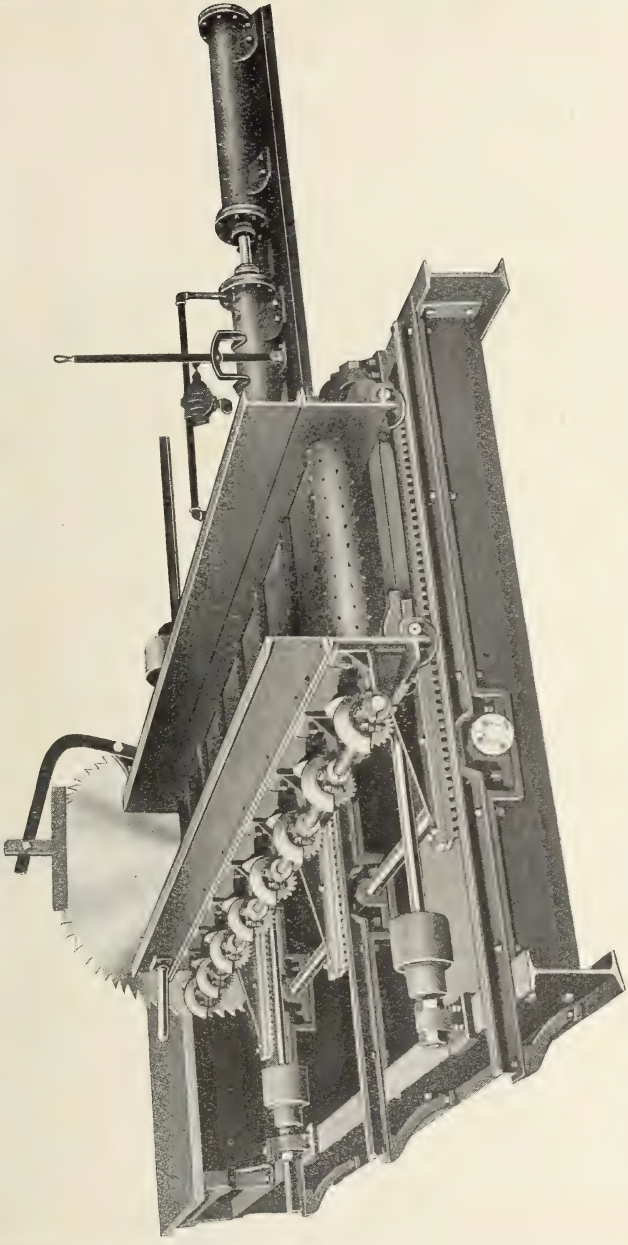

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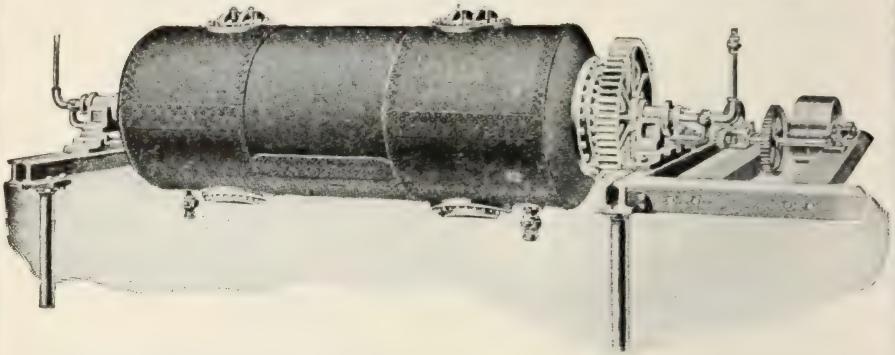

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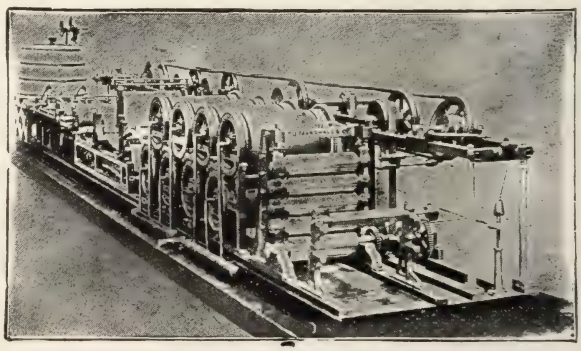

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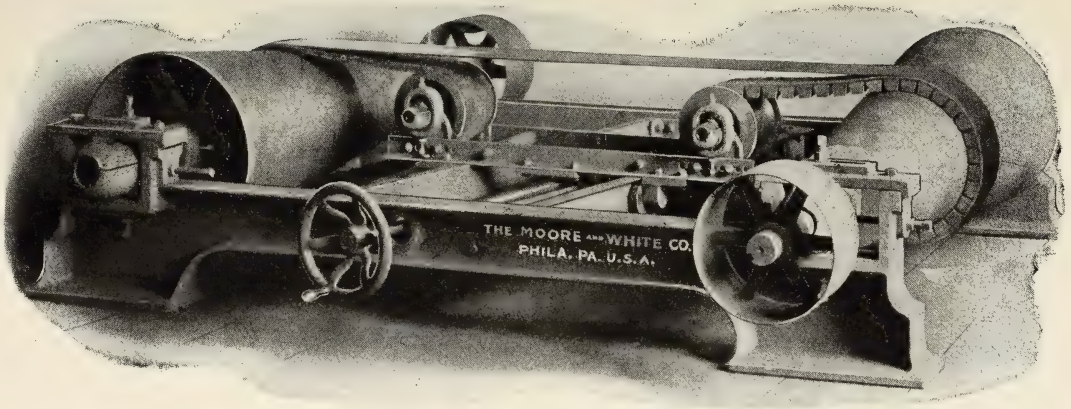

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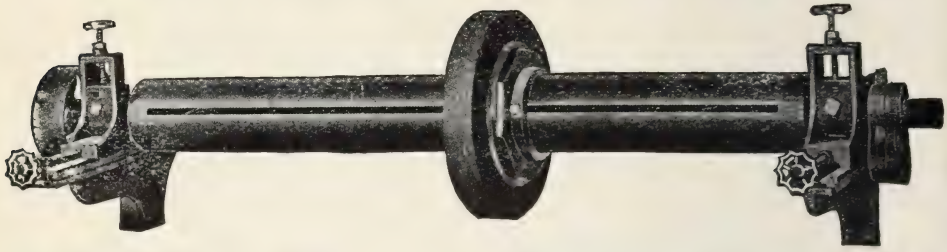

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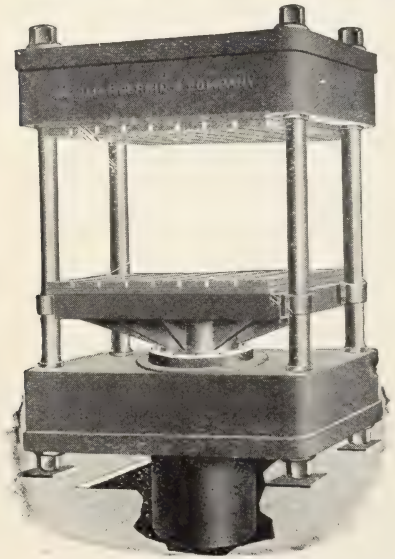

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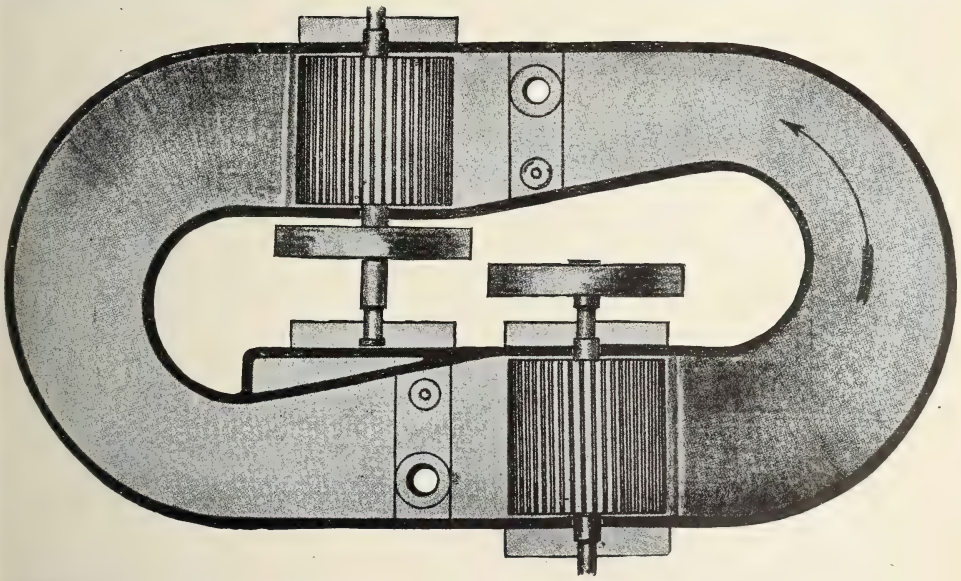

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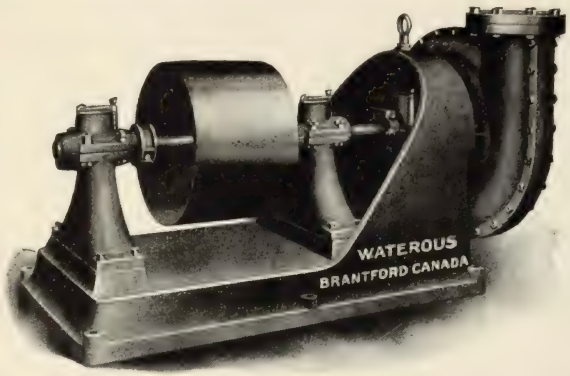

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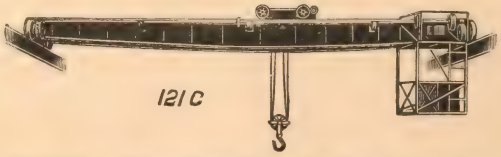

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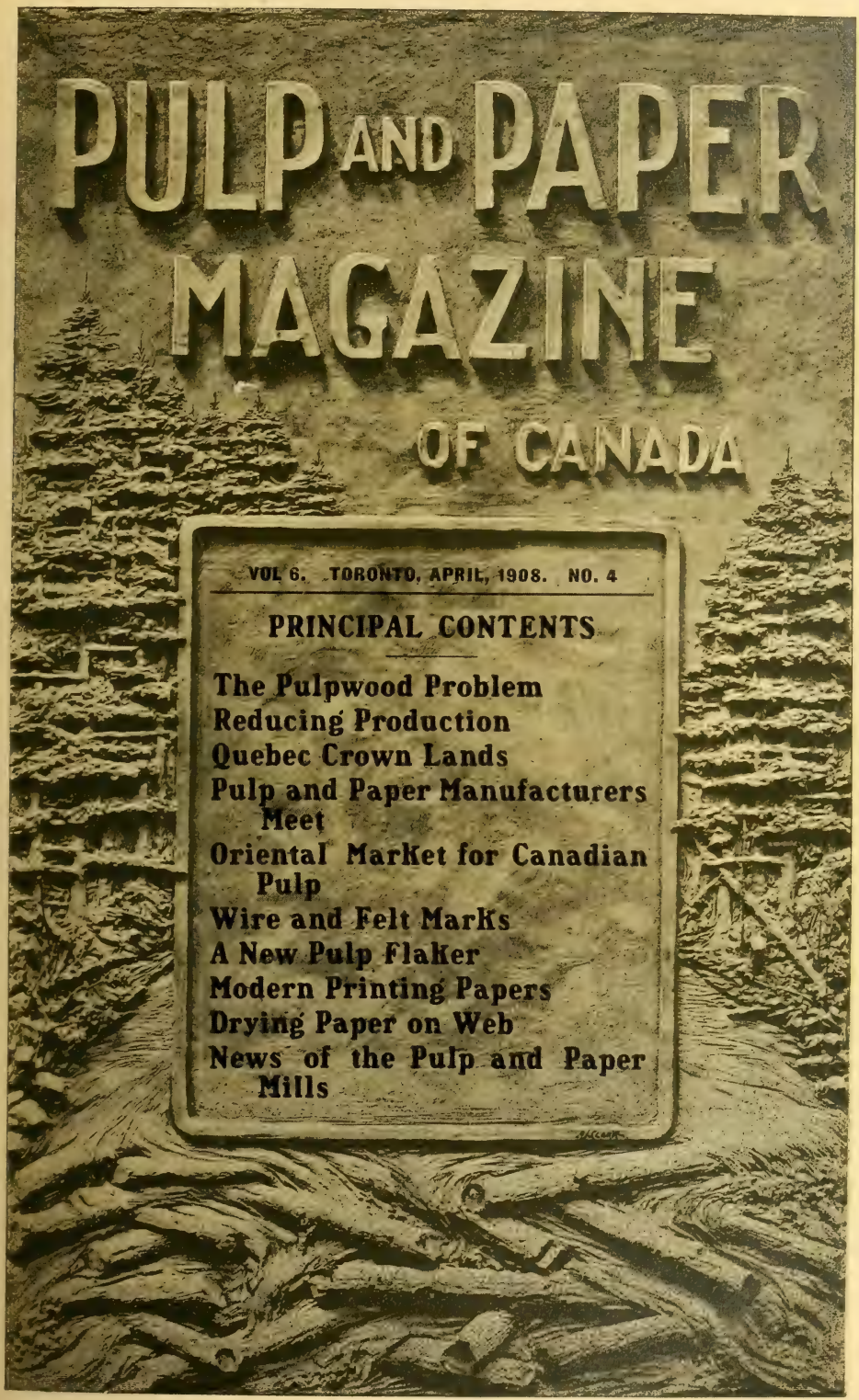

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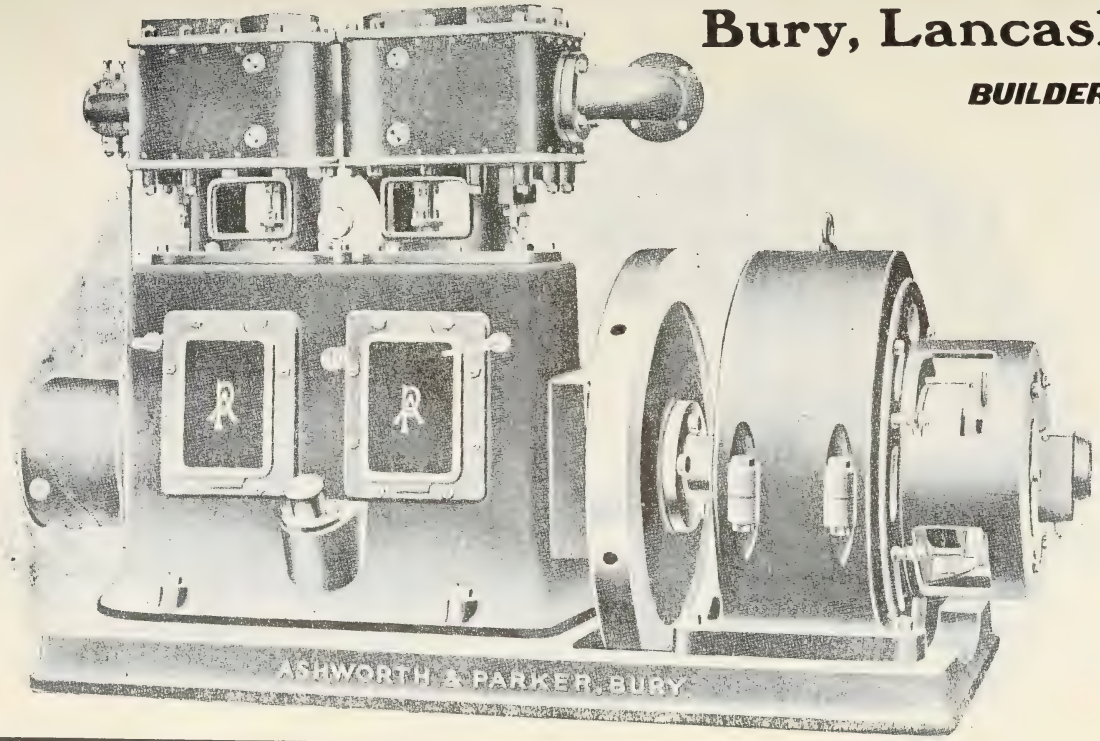

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WESTERN VIEWS ON PULP.

The Port Arthur, Ont., "Chronicle" of 17th ult. has this paragraph:—

The pulp-wood industry is becoming important in this district. During the winter local people have been buying up pulp-wood from the settlers of the district. All winter the wood has been hauled into the city and piled up on the ice near the Canadian Northern elevators and opposite the C.P.R. docks. There are now hundreds of cords of wood here ready for shipment to the pulp mills at the Soo. This industry was commenced by Geo. Whalen a couple of winters ago. He started in on a small scale, but now, besides purchasing from the farmers, he has a number of camps operating. The delivery of so much pulp-wood from this district shows the necessity of a movement being commenced for the opening up of a pulp mill at this point.

The Grandview, Man., "Exponent" of March 20th said:—

"Something badly wanted in Western Canada at present is one or two paper mills. White paper costs Western publishers just double what it costs their fellow publishers in the east. The extra cost is largely due to freight. We have abundance of raw material for paper making, and a concrete effort should be made to induce those who understand the paper making business to come out West and make fortunes. Building paper and wrapping, as well as news and writing papers, can be made here Western boards of trade should bring the matter to public notice."

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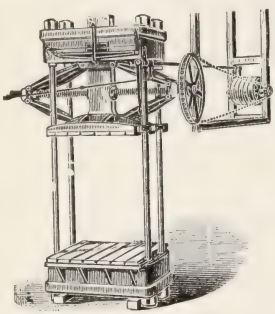

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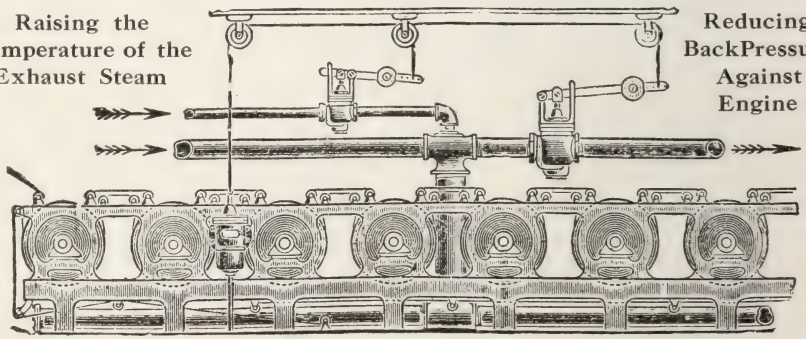

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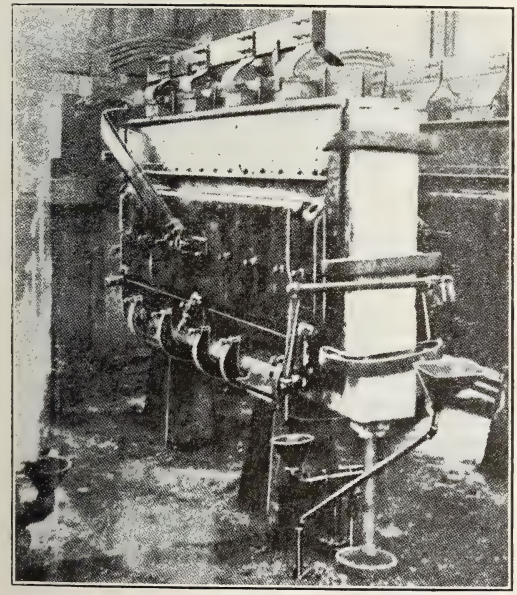

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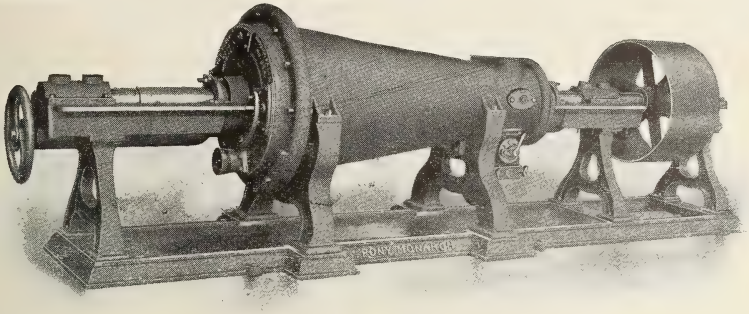

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JORDAN ENGINES - - - - 4 SIZES - - - - 10-24-30 & 40 TONS CAPACITY.

BEATING ENGINES	BINDERS' BOARD MACHINES	LEATHER BOARD MACHINES
RAG CUTTERS	STUFF CHESTS	FAN DUSTERS
STUFF & FAN PUMPS	PIN DUSTERS	R R DUSTERS
FLY BARS	BED PLATES	THRASHERS

FAWCETT PRESTON & CO., Limited, Engineers

Phoenix Foundry, 17 York St., LIVERPOOL, England

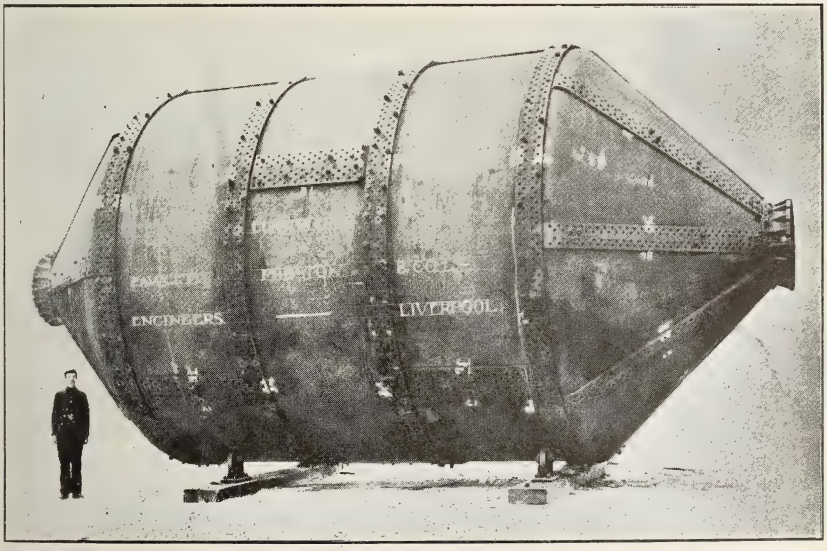


Photo shows Digester 17 ft. 6 in. diam. x 36 ft. 8 in long supplied to **Edward Partington Pulp & Paper Co., St. John, N.B.,** being the fourth digester supplied by us to this mill. Write for circulars and price

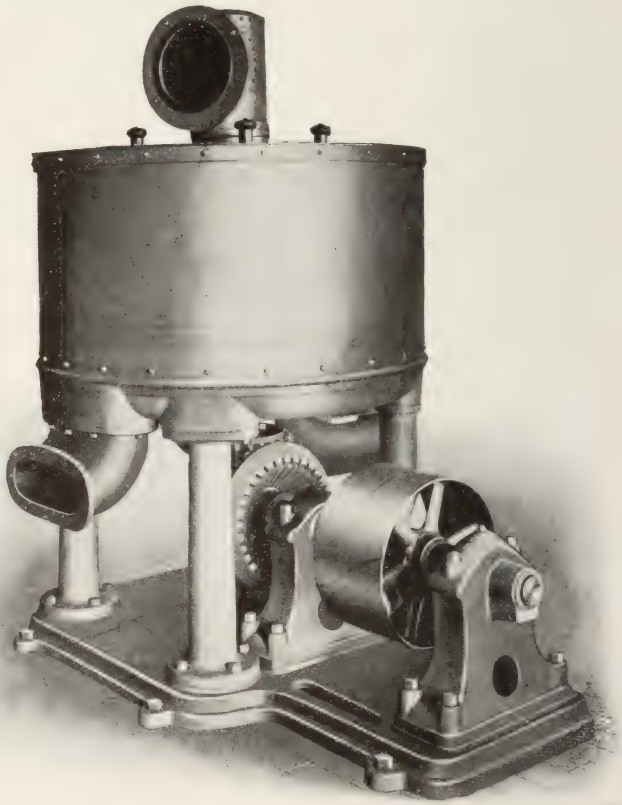
The Ruth Centrifugal Pulp Screen

The Only Self-Cleaning Pulp Screen in the Market

The Screen Plate is so arranged that it **positively cannot clog.**

They require practically no attention, very little space and operate with a minimum of power.

The most **Durable, Accessible, Economical and Practical** Screen on the market to-day.



Screens are installed free of all charges tor thirty days' trial, and **we have never had a Screen returned from any trial.** One week's work of this Screen will convince you of its merits. All we ask is a fair trial.

Over sixty in use in the largest pulp and paper mills in the United States.

Write for full particulars to

Contractor's & Pulp Mill Machinery Co.

THOROLD, ONTARIO

SOLE MANUFACTURERS FOR CANADA.

PROVINCE OF QUEBEC LIMIT HOLDERS' ASSOCIATION.

The annual meeting of the Province of Quebec Limit Holders' Association took place on the 7th inst., at which J. F. Booth was elected president for the coming year; George H. Perley, M.P., and S. P. Grogan, vice-presidents. The former Executive Committee were re-elected, with the addition of William Russell and J. A. Rousseau, M.P. Paul G. Owen was re-elected secretary-treasurer.

In the evening a banquet was held, at which two Ministers, Messrs. Weir and Kane, were present.

Mr. Weir spoke eloquently, taking as his theme the necessity of educating the public to the necessity of preserving our forests, and he advised the limit holders to direct their energies to that end.

The following firms were represented at the meeting:—

Union Bag and Paper Co., the Gres Falls Co., the Charlemagne and Lac Ouereau Lumber Co., the Riordon Paper Mills, Limited, Price Brothers & Co., Limited, Jonquiere Pulp Co., the Arthabaska Water and Power Co., Laurentide Paper Company, the Burgess Sulphite Fibre Co., Price Porritt Pulp and Paper Co., Quebec and St. Maurice Industrial Co., J. A. Rosseau, Esq., M.P., Henry Atkinson, Esq., Randolph & Baker, Donald Fraser & Sons, Beauce Pulp and Lumber Co., James Richardson Co., St. Maurice Lumber Co., Lake Megantic Lumber Co., Hiram Calvin, Esq., M. A. Grandbois, Esq., G. H. Perley & Co., Hull Lumber Co., the River Ouelle Pulp & Lumber Co., Bennett & Co.

The above mentioned, accompanied by Messrs. H. K. Egan (Hawkesbury Lumber Co.) and David Gillies, of Gillies Brothers, waited on the Quebec Premier and Hon. Mr. Turgeon and protested against the changes in the law.

The Premier received the delegation and listened to the complaints, but in reply expressed his opinion that the legislation would have to go through, and that no amendments such as proposed by the limit holders could be introduced.

He, however, recognized that the limit holders had cause to complain, and he advised this Association to use its energies to educate the public through the press regarding the depredations of speculators.

A general election is to be held soon in Quebec, and the great question before the people is the selling of lots out of forest lands, and the Government, in the present state of public opinion, which would seem to limit these sales, would become unpopular with a large number. They are trying to prove that they have sold more lots than anyone else, and the Opposition is trying to prove the contrary. Under these circumstances the limit holder is the chief sufferer, as he always is when a general election comes on. It simply means to give away lots in order to get votes. It is nevertheless true to a certain extent that opinion has undergone a slight change, and the public are beginning to show an interest in the preservation of the forests, and letters are even appearing in the papers ridiculing the supposed colonization which is going on in the Province of Quebec.

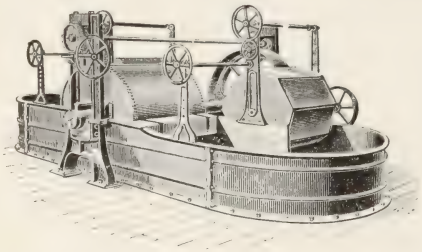
—The Ottawa Pulp and Paper Co. has been authorized to increase its capital from $25,000 to $50.000.

—The manufacturers of book papers, wrappings and bags have held meetings during the past two weeks with the object of arriving at a greater degree of uniformity respecting prices, terms, etc. As a result, the cutting of prices, which had become severe in one or two lines, is likely to be stopped.

HOLYOKE MACHINE COMPANY

HOLYOKE, MASS., U.S.A.

MANUFACTURERS OF

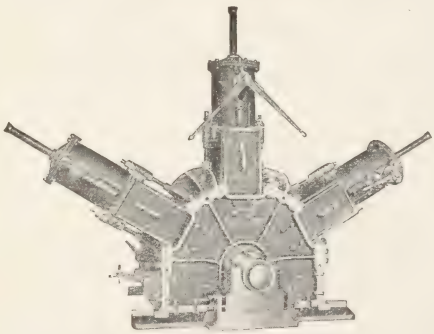


Washing and Beating Engines with Patent Double Hoist and Tubs of either wood or iron.

Hydraulic Pumps and Presses.

Rag Cutters and Rag Dusters.

Cotton and Paper Rolls with Patent Fastenings.



Patent Improved Wood Pulp Grinder.

Elevators, Rotary Fire Pumps and Friction Gearing.

Gears Accurately Spaced and Planed.

Shafting, Pulleys and Mill Work.

Machinery for Wood Pulp and Paper Mills.

Vertical and Horizontal Water Wheels with Flumes and all connections.

Wood Barkers, Wood Chippers and Wet Machines.

Newest Designs

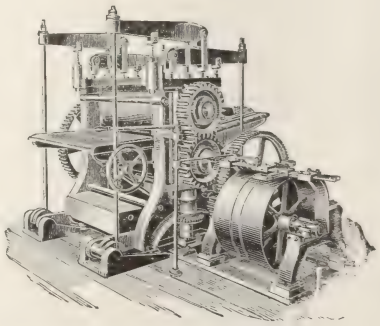
AND

Highest Efficiency

Calenders. All kinds of Super-Calenders, Friction Calenders and Platers.

Chilled Iron Rolls.

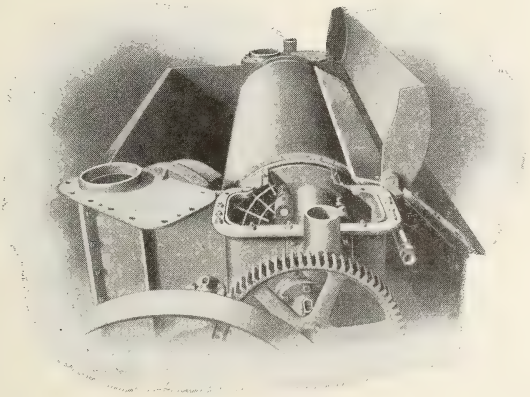
Special Machinery.



Description and Estimates Furnished; also Gear List and Catalogs sent on application.

THE PNEUMATIC SAVE-ALL

Saves over 90 per cent. of the fibre ordinarily lost in white water. Automatic, continuous and absolutely uniform in action.



In this perfected Save-All the white water is drawn by suction through the wire cloth of a cylinder mould, leaving over 90 per cent. of its fibre in a compact layer upon the cylinder. This fibre is continuously lifted from the cylinder by air pressure and sent down over a deflector plate to a reservoir. No couch roll is used. The action is positive, the density of the reclaimed stock may be absolutely regulated as desired, the capacity of the Save-All is very large, it is economical to install and operate, and the values saved are surprisingly great.

Let our Save-All experts examine and report upon the application of this machine to your mill.

Also send for Illustrated Catalogue C.

IMPROVED PAPER MACHINERY CO.

NASHUA, N.H., U.S.A.

OLIN SCOTT, M.E.,

BENNINGTON, VT., U.S.A.

Manufacturer of best up-to-date

PULP MILL MACHINERY

including the

NEW ENGLAND WOOD PULP GRINDER, SCREENS, WET MACHINES, SAWING MACHINES, BARKERS, SPLITTERS and CONVEYORS.

Can furnish plans for mills, also furnish complete outfit of machinery including shafting and gearing, and can name price for the complete outfit for a mill, with full guaranty for the production of the mill and the integrity of the machinery, and give ample opportunity to test the machinery under the guaranty before paid for.

The 1906 pattern of pulp grinder was sold last year to make 6 tons daily of fine pulp, and when tested under the warranty made considerably more. The pulp machinery made at this establishment includes about 600 pulp grinders used in 143 mills scattered through the United States, with 21 mills in Canada and Newfoundland, also in Mexico, Japan, Sweden, Norway, Germany, and one mill for the Emperor of Russia. Have machines on hand for prompt delivery, and can furnish machinery at reasonable prices.

Can give liberal terms of payment to responsible parties.

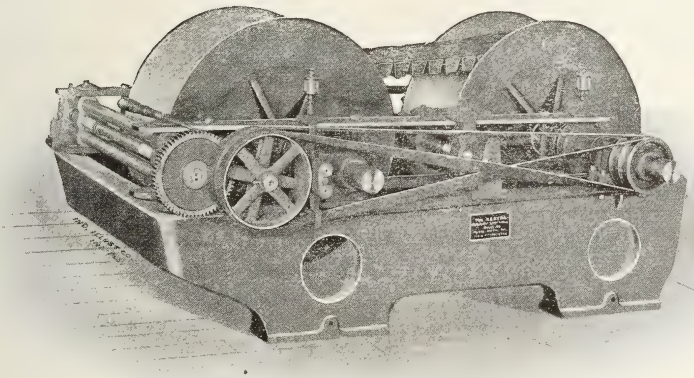
No charge for specifications and reliable estimates for cost of mills.

The Greatest Money Making Machine for the Paper Manufacturers

THAT HAS EVER BEEN DEVISED IS

"The REEVES"

Variable Speed Transmission



THIS is the Machine that has stopped up the leaks where the profits have been wasted in a large number of the paper mills of this country. It has been the means of turning many paper-making properties, which have been run without any profit, and sometimes at a loss, into paying investments. With it you do not need to close down your machine to make a change in the speed, but keep right on turning out paper and making profits. WRITE FOR CATALOG NOW.

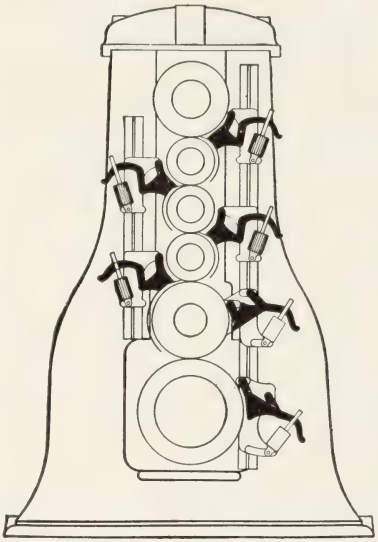
REEVES PULLEY COMPANY,

COLUMBUS, INDIANA, U.S.A.

DILLON MACHINE CO.

BUILDERS OF

PAPER MILL MACHINERY

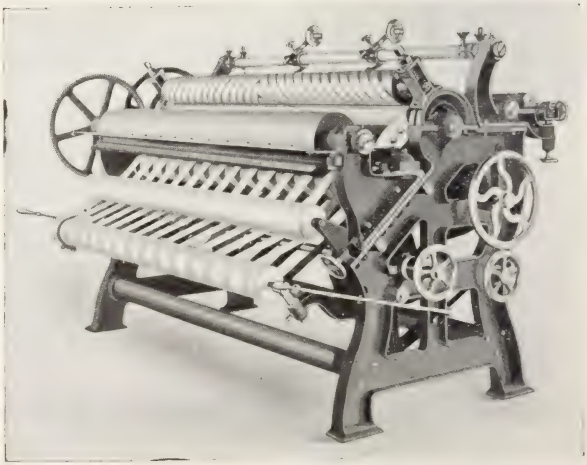


DILLON DOCTORS AND FEEDS

DILLON MACHINE CO. LAWRENCE MASS.

- Beating Engines
- Washing Engines
- Jordan's Three Sizes—Single, Double & Triple Stuff Pumps, with Dillon Patent Valve Seating
- Wet Machines
- Horizontal and Vertical Stuff Chests
- Single and Double Paper Cutters
- Backstands
- Plates, Knives and Bars

DILLON PATENT DOCTORS AND FEEDS MADE IN CANADA BY THE SHERBROOKE IRON WORKS, SHERBROOKE, P.Q.



LAWRENCE, MASS., U.S.A.

Have You Heard

The Facts About

THE BELOIT MACHINES?

One Fourdrinier built for 500 feet has run 615 feet, and averages 550 feet and makes 72,000 lbs. of print in 23 hours.

Another, built for 350 feet for manillas, is running 490 feet every day on print.

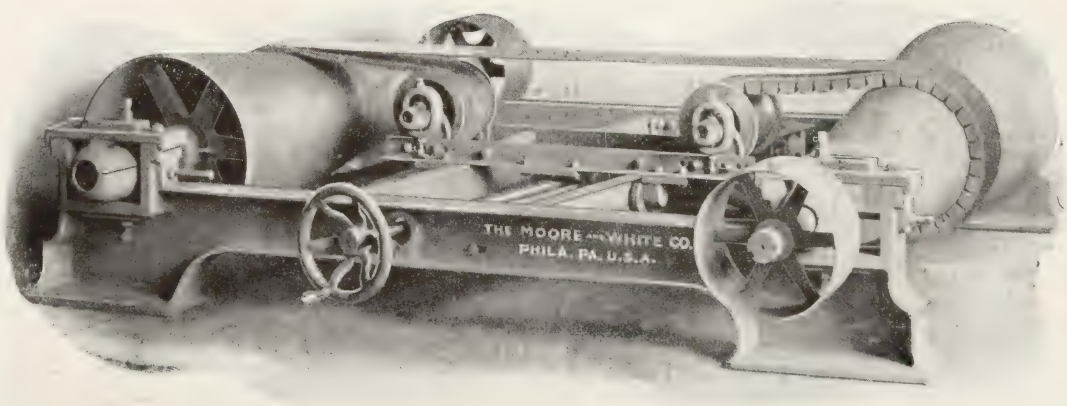
Two others, built for 250 feet on book, are now speeded up to 340 feet on book.

A cylinder machine built for 40 tons of strawboard has made 60 tons in 23 hours.

BELOIT IRON WORKS

BELOIT, WIS., U.S.A.

"Moore & White" SPEED CHANGE for Paper Machines.



WIDE BELT. PERFECT CONTACT.

ANY DESIRED RATIO OF CHANGE.

Absolutely No End Thrust or Tendency Sidewise of Transformers or Driving Belt.

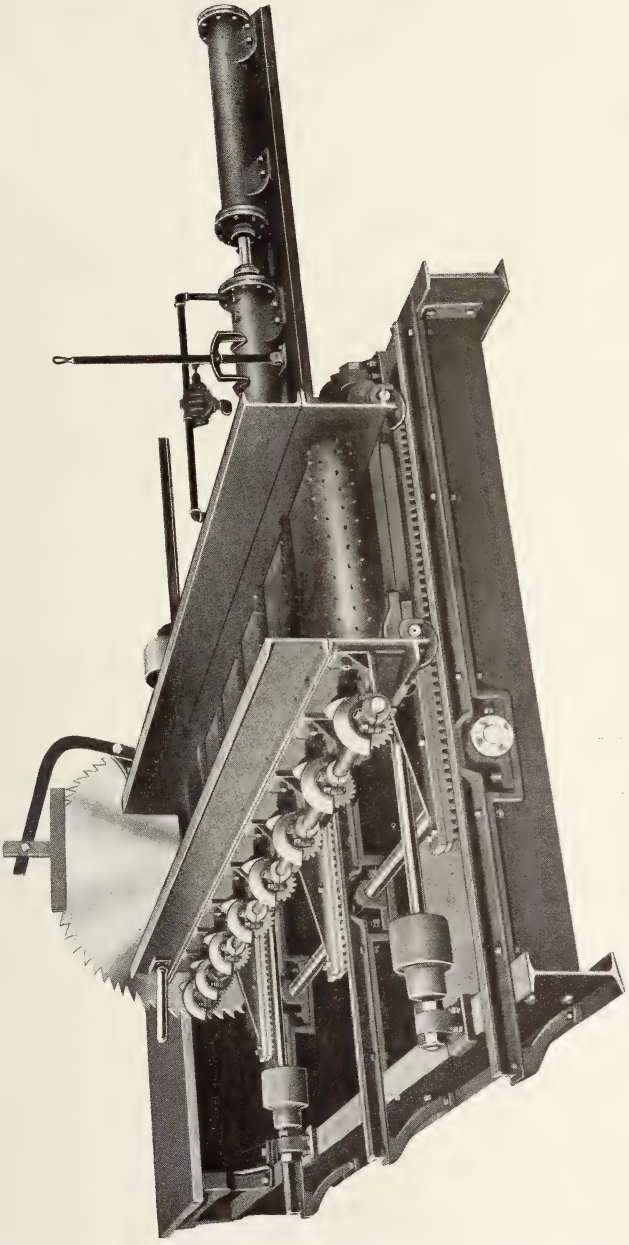
The Moore & White Co.

PHILADELPHIA, U. S. A.

BUILDERS OF PAPER MAKING MACHINERY

STEAM, FEED, PULPWOOD CUT-OFF SAW

SUPERIOR TO ALL OTHERS



CAPACITY 125 CORDS 10 HOURS

FLOOR SPACE, 21 FT. X 9 FT.

WEIGHT 16,000 LBS.

BUILT BY

VALLEY IRON WORKS CO.,

APPLETON, WISCONSIN, U. S. A.

Wilson-Paterson Co'y

127 BOARD OF TRADE BLDG., MONTREAL.

Agents for the United AlkaliCo. of England

OFFER TO THE TRADE:

Caustic Soda 60° to 78° Soda Ash, Caustic Potash, Sal Soda, Silicate of Soda, China Clay, Rosin size and a full line of Rosins, direct shipment from the south.

Contracts made for regular supplies. F

TUCK'S

"TUCKSONA" BALATA BELTING

THOROUGHLY WATERPROOF

SUITABLE FOR ALL KINDS OF

Engineering Work - Pulp and Paper Mills, etc.
Electric Lighting - Brick-Making
Agricultural Machinery.

EVERY BELT GUARANTEED. Stock 1 in. to 15 in. in Montreal.

A. HAWKSWORTH & SONS CO., Ltd., 551 St. James St., MONTREAL.

CARTHAGE MACHINE CO.

CARTHAGE, N.Y., U.S.A.

MANUFACTURERS OF

Wood Pulp and Sulphite Fibre MACHINERY

Our Specialty

Also

Barkers Pumps Wet Machines

THE
PULP AND PAPER MAGAZINE OF CANADA

Vol. 6.—No. 4. TORONTO, APRIL, 1908. $1 A YEAR SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month, and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

BIGGAR-WILSON, Ltd.,

PUBLISHERS

OFFICES, CONFEDERATION LIFE BUILDING,

TORONTO, CANADA.

THE PULP-WOOD PROBLEM.

E H. Lewis, M.P. for West Huron, supplemented the good work he has been doing in Parliament on behalf of the Canadian pulp industry by an admirable address to the Toronto Canadian Club on the same subject.

"Is Canada," he asked, "to go on exporting, in ever-increasing quantities, a great natural asset in its practically natural state, or is she to take such action as will result in its manufacture within her own borders, and thus have the payrolls of many, many millions of dollars paid to Canadian, in place of United States, labor, as at present?"

Canada, he said, had already arrived at that point at which Canadians could no longer speak of their inexhaustible forest supplies. Canada, however, still had the greatest areas of commercial timber in the world to-day, and in Ontario and Quebec the largest areas of best pulpwood. Pulpwood cut on the Crown lands in Ontario had to be manufactured into pulp or paper in the Province. Quebec had no such restrictions, and no steps were being taken to prevent United States corporations from adding to their already immense holdings of timber lands. This was true also of Nova Scotia. The Americans were acquiring vast areas that they might secure supplies for their mills south of the line and give employment to thousands there at the expense of Canada.

Mr. Lewis then gave an object lesson thus: Japan imports 5,000,000 pounds of British paper and 8,500,000 of American paper—Canada is not mentioned. England imports $28,369,075 worth of paper—principally from the United States. Where does she get her wood pulp? From Canada. Yet Canada is not mentioned.

"I believe," he continued, "for obvious reasons, that the press of the United States would fight against any action by their Government which would have a tendency to keep out of their market paper made in Canada. We have control of the raw material necessary for the making of their news paper."

On the other side of the line Representative Sulzer, of New York, has introduced a bill in the House to place wood pulp and printing paper on the free list. He said he proposed to make an individual filibustering raid against all Republican legislation until the Republican leaders should declare their willingness to pass such a measure.

Describing the paper "trust" as one of the "hydra-headed monsters which have been tightening their hold upon the people," Mr. Watkins (Louisiana) made a plea for the immediate removal of the duty on wood pulp with a corresponding reduction on paper made from wood pulp. The newspaper, he argued, was one of the main civilizing agencies of the world, and in this country "sheds light in fifteen million homes." However, it should be noted that the effort on the part of the American Newspaper Publishers' Association to secure legislation by Congress putting print paper and wood pulp on the free list has received rather a shock because of the absolute refusal of the Ways and Means Committee to even give them a hearing.

REDUCING PRODUCTION.

Some of the pulp mills have closed down or curtailed their production, owing to the unsatisfactory condition of the market. It is true that stocks of pulp on hand are by no means large; but the demand is so small and so slow that this fact does not as yet seem to accelerate any disposition to purchase. Other mills are understood to be contemplating steps similar to the above, and there is a good deal to be said in favor of such a course. To turn out a large stock of ground wood at the present time, thus placing a surplus of any size on the market while business remains in its present state would tend to reduce the price for some time to come, and prices once beaten down below a normal standard are often difficult to bring up again to a profitable standpoint. The best course probably is for the market to be put in a position to recuperate, which, with a favorable season for farm operations, the opening of navigation, etc., it may quite likely do at no distant day.

QUEBEC CROWN LANDS.

It is to be regretted that, although the Minister of Crown Lands for Quebec recognized in his annual report the failure of the system now in force, by which agents can sell land without any control from the Department, that the Government did not see fit to introduce any amendment doing away with this regrettable condition of affairs. He has seen fit, however, to take away from the limit holder the preference which he had by the law, to buy from the settler the timber cut in his clearing.

While, perhaps, having to take this action in deference to what they imagine is public opinion, the Government are fully alive to the serious state of affairs in Quebec Province, and when the next Parliament meets it is to be hoped that a serious and well-studied effort will be made to protect the lumbering interests of that Province against the inroads of speculators, who are doing such irreparable damage to the forests and watercourses.

The Government is suffering, perhaps somewhat unjustly, from a cry that has been raised to the effect that they are not helping the settlers. This word "settlers" is often used by timber pirates to screen their own depredations. The Government has doubtless done a good deal to help bona fide settlement in Quebec, but the facilities that were intended for the help of bona fide settlement have been taken advantage of by timber pirates to the exclusion of the bona fide settler. This is exceedingly unfortunate.

FILLING FOR PAPER.

The fillings employed in paper manufacture, China clay, talc, etc., are quoted at very varied prices, especially as it has now become usual to offer imperfectly levigated products, full of sand and coarse grains of every kind. It will be evident to every paper-maker that he gains nothing by purchasing such unsuitable fillings, because he must do himself what the purveyor should have done, i.e., purify the coarse materials before he can use them in his processes. The necessary levigation of the crude material ought never to be done by the paper-maker. We think, therefore, that a few hints with regard to the practical valuation of mineral fillings as respects fineness may be useful to the paper-making trade.

One of the best tests is afforded by a mouth test, the sample being ground between the front or incisor teeth. Very inferior samples of filling material create a cold feeling in the mouth, and it is clear that the presence of sand, or of imperfectly ground particles of the otherwise legitimate filling material, is easily detected in the mouth, where the sense of touch is more delicate than in any other part of the body.

A method which is independent of the sensitiveness of the mouth will no doubt be useful, and is as follows: Take two flasks, holding about a pint each, and fill them about half full of water. Then weigh out about an ounce of each of the two fillings to be compared. The exact weight is not important, but it must be the same for both the substances to be tested. Then take one flask in each hand, shake well, and hold both up against a window. The fine particles will then settle around the sides of the flask, while the coarse impurities will go direct to the bottom. A practised eye can then decide whether the impurities are in excessive amount. By careful watching of the settlement of the solid particles against the sides of the flask, a further discrimination can be made. While the very coarse particles go directly to the bottom of the flask, some of the less coarse particles settle together with the finest round the sides, but they form the first ring round the bottom deposit, as they go down faster than the finely levigated stuff. Hence, when the whole deposit has been finally formed we have on the bottom of the flask a central nucleus of coarse matter, surrounded by concentric rings of insoluble but finer matter in order of fineness. In this way a practised experimenter can judge of the fineness of earthy paper fillings without having recourse to sieves in a very short time. The only quantitive precaution has been already mentioned, viz., that the two fillings to be compared must be compared in exactly equal weights.

—Stimulated by the high price of pulp-wood, an unusual quantity has been got out during the past winter in Ontario and Quebec, and thousands of cords are still lying at stations awaiting shipment. Much of this was on order from United States mills. Slack trade across the border may leave a good deal of this wood on the hands of purchasers or sellers, with the result of a drop in price.

PULP AND PAPER NEWS

The Kingston "News" newspaper has been sold to W. R. Givens, of New York, S. N. Newton, of Oshawa, and others.

* * *

The National Stationery Company, Toronto, suffered a loss of about $1,500 by fire. The damage was fully covered by insurance.

* * *

The Niagara Paper Box Co., Limited, Niagara Falls, Ont., has been incorporated. W. L. and C. J. Doran, of that place, are provisional directors.

* * *

A St. John, N.B., newspaper stated that Reid Bros., paper dealers in that city, were about to sell out. This, however, is denied by the firm.

* * *

The Arcade Printing Co., Toronto, capital $40,000, has been granted a charter to do a general printing, lithographing, binding and publishing business.

* * *

The Riordon paper mill, Merritton, Ont., closed down a few days ago for two weeks for some extensive repair work. Extensions are also to be made to the Hawkesbury plant.

* * *

Eaton, Crane & Pike Company, incorporated under Maine laws, has been granted a license to carry on business in Ontario, manufacturing and dealing in paper, envelopes, and paper boxes.

* * *

The Miramichi Pulp and Paper Company's mill at Chatham, N.B., has closed down pending an improvement in the condition of the pulp market. In the meantime several necessary repairs are being made.

* * *

A bill has been introduced in the United States Senate with a view to ending the lumbermen's boundary conflicts on the St. John River in New Brunswick by repealing the law permitting American-owned and cut lumber manufactured in Canada to enter the United States free of duty.

Cassell & Co., Limited, the London, Eng., publishers, have been authorized by the Ontario Government to do business in Ontario as printers and publishers. J. Mortimer Kelley, 63 Howland Avenue, Toronto, is their attorney.

* * *

The Rural Publishing Co., Peterborough, Ont., has received a charter to print books and agricultural papers. Capital, $100,000. G. N. Morang, publisher, Toronto, and H. B. Cowan, Peterborough, are members of the Company.

* * *

Geo. W. Fowler, M.P., has issued a writ for $200,000 damages against Chancellor Sir John A. Boyd, Hon. G. W. Ross, Union Trust Co., John I. Davidson, and E. G. Stevenson, Supreme Chief Ranger of the I.O.F., on the ground of fraud and conspiracy in connection with lumber deals in the West.

* * *

A new Canadian society has been organized under the name of the Canadian Society of Forest Engineers. It is intended to unite in one body all those interested in the science of forestry throughout the whole Dominion for the discussion of technical subjects pertaining to the profession, and for the maintenance of a high standard of work. The officers are: President, Dr. B. E. Fernow, Toronto; vice-president, E. H. Campbell, Ottawa; secretary-treasurer, F. W. H. Jacombe, Ottawa.

* * *

A deputation of prominent pulp manufacturers waited on the Quebec Government last month and stated that a French timber speculator named Micquelon had acquired by fraudulent means 10,000 acres of fine spruce limits in Nominique district, included in the limits of the Riordon Paper Mills. The means alleged to have been adopted were that he induced over one hundred different persons to take up lots under the guise of settlers and then turn them over to him for a nominal consideration.

NEWS OF THE MILLS

There was a strike at the Winnipeg paper box factory a few weeks ago, but the employees have now returned to work.

* * *

The water in the mill race supplying the Lincoln Paper Mills, Merritton, was withdrawn recently to allow of some needed improvements being made.

* * *

The Booth and Eddy mills at Ottawa and Hull have been hampered by low water. The latter are using considerable auxiliary electric and steam power to keep them running.

* * *

J. R. Booth, of Ottawa, celebrated his eighty-first birthday on the 5th inst. His vigor remains unimpaired, as is indicated by the fact that he is still superintending work in a flume at his mills, though recently unfortunately sustaining a sprained ankle while working.

* * *

P. M. Hamlin, manager and superintendent of the Pennsylvania Paper Mills, has been appointed manager and superintendent of the British Canadian Wood Pulp and Paper Co., Howe Sound, B.C. He is familiar with the soda process, such as that Company is now installing.

* * *

The prominent members of the Imperial Pulp Co., questions about which were asked recently in the Dominion Parliament, are given as follows: Sir Daniel McMillan, Lieutenant-Governor of Manitoba; Theodore A. Burrows, M.P., and R. A. Pattinson, of Winnipeg (secretary).

* * *

The Quatsino Power and Pulp Company have completed plans for the immediate installation of a pulp mill at Quatsino Sound, B.C. Men have already gone up to the proposed location to install the plant. The Company has about 56,000 acres of pulp lands in the district.

It is stated that the Aroostook Lumber Company, St. John, N.B., will likely sell its mill property there to the Great Northern Paper Company. The paper company has purchased timber lands on the head waters of the Presque Isle stream from which the Aroostock Lumber Company has been obtaining a supply of logs.

* * *

While the matter is not yet finally decided, it is stated that the Rhinelander Paper Company, of Rhinelander, Wis., who were negotiating for the purchase of the Spanish River Pulp Company's property, are not likely to carry out the deal, owing to the stringency of the money market, and that their deposit of $100,000 will probably be forfeited.

* * *

The Canada Paper Company's mills at Windsor Mills, Que., were closed down a few days ago for necessary repairs and putting in two new press rolls on the book and wrapping machines. R. Aitken, who was formerly with this Company, but who has latterly been with the St. Raymond Paper Co., St. Raymond, Que., has been reappointed mechanical superintendent.

* * *

The Ouiatchouan Falls Pulp Co. has been reorganized with American and Canadian capital, the former being represented by Perkins, Goodwin & Co., the well-known paper dealers of New York. A. E. Dubuc, of the Chicoutimi Pulp Co., will supervise the operations of the mill, which is now running, and will devote a great part, if not all, of its output of pulp to the export trade.

* * * *

The Ontario Government have made arrangements for an extension of their guarantee on the $1,000,000 of the Canadian Improvement Co., which was formed to finance the Lake Superior Co. At a meeting of the directors of the above Company Chas. D. Warren

was elected president, Francis B. Reeves first vice-president, T. J. Drummond second vice-president, and John T. Terry, Jr., secretary-treasurer.

* * *

At the annual general meeting of the E. B. Eddy Company, Limited, held at its head office at Hull last month, the president and treasurer, W. H. Rowley, presented a very satisfactory statement of last year's operations, notwithstanding the increased cost of raw materials used and the serious competition and cutting of prices in some of the important lines they manufacture. The heaviest cuts were in woodenware and in paper bags. There had been no diminution in the volume of business throughout Canada, where they have nearly a score of branches and agencies and depots established, all the way from Halifax to Victoria. Directors were re-elected as follows: S. S. Cushman, vice-president; Mrs. J. G. H. Eddy, J. J. Gormally, K.C., G. H. Millen, joint managers; W. H. Rowley, president and treasurer.

* * *

Representatives of an American syndicate, composed of J. L. Trowbridge, of Chicago; F. L. Wessel, of New York, and G. W. Brinkerhoff, of Kansas City, have made a thorough investigation of the water power at Fort Frances, Ont., with a view to setting up a large paper mill there. Recent reports—and it may be mentioned that many rumors about this Fort Frances proposition have been difficult to verify—state that the pulp concession has been sold by the Government to J. T. Horne, of Fort William, who has turned it over to a company called the Northern Construction Company. The power dam near the town is about completed.

* * *

A test was made recently of the plant already erected at Swanson Bay, B.C., by the Canadian Pacific Sulphite Company, Limited, and everything worked to great satisfaction. The buildings in course of completion, besides the sawmills, designed to utilize wood, better adapted for lumber than for pulp-making, comprise a wharf area of over two acres, a blow pit room 39 x 67, built of concrete and wood; a boiler house, 65 x 60, altogether of concrete and fireproof, with metal roof; a digester building, 28 x 67, containing two digesters, also constructed of concrete; a screen-room, 40 x 60 feet, and a machine room, 252 x 40 feet. The sulphur storage rooms are 60 x 35 feet, while the sulphur burning rooms are 40 x 35. The cooler building is 40 x 40, with towers 30 feet square and 150 feet in height. The boiler house contains five boilers, each of 208 horsepower, and while power for running the machinery is supplied by water, the boilers will furnish steam for the transmutation of wood into pulp. Water power is obtained from Swanson Creek, and already 1,400 horse-power has been developed. A sixty-inch main carries the current for a distance of 800 feet, after which the power is led through an additional 400 feet of forty-two-inch mains and delivered to turbine wheels, two of which are in the wood preparing plant, and the third is the pulp mill proper. The Company, which will at present engage only in the manufacture of sulphite and chemical pulp, will ultimately develop a plant for the manufacture of mechanical pulp. For this purpose the horse-power will be increased to 10,000, and the draft for the supply will be made upon Yule Lake, which is half a mile from the present works. The present head is 132 feet, but the introduction of Yule Lake as a motor factor will give 362 feet head.

—The Pusey & Jones Co., Wilmington, Del., has received an order from the Edward Lloyd Paper Mills, Sittingbourne, Eng., for two large machines of a width respectively of 170 and 156 inches.

ST. RAYMOND PAPER COMPANY

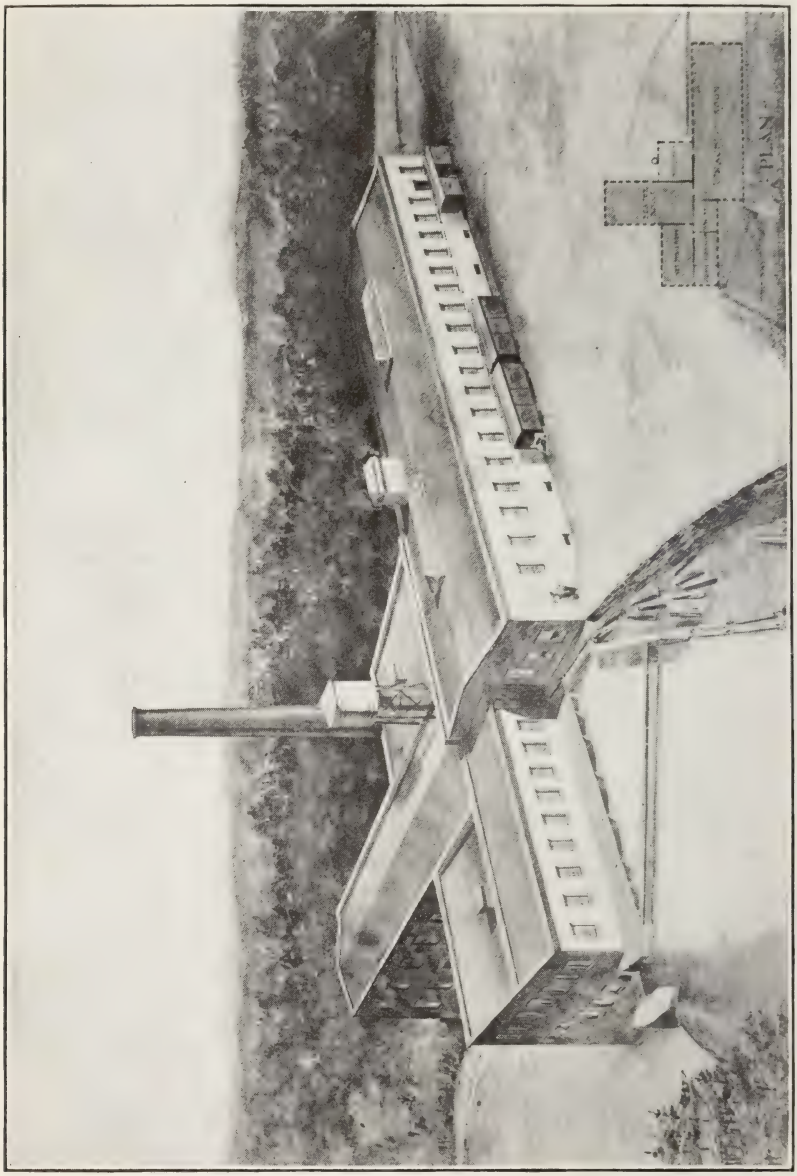
The St. Raymond Paper Co. has developed from the St. Raymond Co.'s pulp mill, which was established five years ago near St Raymond Station, on the Quebec and Lake St. John Railway. and on the Ste. Anne River. about thirty miles above Quebec city. The pulp mill started with five grinders and three wet presses, but as the mill did not use a quarter of the water power available the Company decided to increase the capacity of the pulp mill and turn the product of the whole into paper. The river which supplies

View of South Fall and Original Pulp Mill, St. Raymond Paper Co., Limited.

Lower End of the Booms, St. Raymond Paper Co., Limited.

this power takes its rise in the Laurentian Mountains, and in normal seasons has a very steady flow. A view of the river at this point is shown in one of the illustrations.

plated for the full capacity of the mill is not yet installed. The paper mill buildings are of fireproof construction, concrete, steel and brick, and the buildings and power development are



Pulp and Paper Mill, St. Raymond Paper Co., Limited.

Owing to the difficulty of getting the building contract through during the past boom in construction work the paper mill only recently started operations, and all the machinery contem-

sufficient for two paper machines of a capacity of fifty tons a day. At present one machine, taking a sheet 118 in. wide, and having a capacity of twenty-five tons a day, is in operation. The

mill has three 1,200 pounds beating engines, one refining engine, and manufactures news print, hanging and wrapping papers.

The pulp mill will have nine grinders, four wet machines, and can turn out thirty-five tons, dry weight, of mechanical pulp per day. At present five grinders are in operation. The pulp mill is 90 x 60 ft., three storeys, and is of stone and brick.

The St. Raymond Paper Co., whose capital is $500,000, is fortunate in having as a portion of its property a timber limit of about forty square miles, chiefly spruce, surrounding its mills, and affording pulp-wood sufficient to keep the mills running for all time should the natural growth not be interfered with by fire. These limits are held in fee simple.

The officers of the St. Raymond Paper Co. are: John Macfarlane, president; Hon. T. Berthiaume, vice-president, and Frank Powell, secretary-treasurer. The other directors are: Fred. W. Evans, W. D. Gillian, J. R. Walker, J. J. Fiske, and Wm. Hanson. Mr. Macfarlane was for many years general manager of the Canada Paper Co., and has a wide knowledge of the history and conditions of the Canadian pulp and paper trade. He was one of the first, if not the actual pioneer, in the export of Canadian pulp to the European market, having made shipments to England in the early eighties, when the idea that Canadian pulp and paper could find a market abroad in competition with the foreign product was considered quixotic. Messrs. Powell and Gillian are also old employees of the Canada Paper Co.

The pulp grinders selected by the St. Raymond Pulp and Paper Co. from several prominent makes in actual use are the "Progressive" grinder, built by the Dix Foundry and Machine Co., of Glens Falls, N.Y., one of the oldest and yet most up-to-date establishments in the United States, their experience on these lines dating back a period of over twenty years, enabling them to produce an almost perfect machine. They were one of the first firms to build hydraulic grinders.

The valve used on this grinder is a marvel of up-to-date simplicity and get-at-able-ness, being a recently perfected and thoroughly tested balance valve, operating easily under heavy pressure. One of its principle features is that all the valves of an ordinary grinder are grouped in one at a convenient point on the back side to which the pressure is piped and exhaust taken away very much simplifying the piping.

Convenient for the operator in front are handles with which to distribute the pressure to and from either cylinder.

It also allows of either cylinder being packed separately while the others are running.

DIX FOUNDRY AND MACHINE COMPANY.

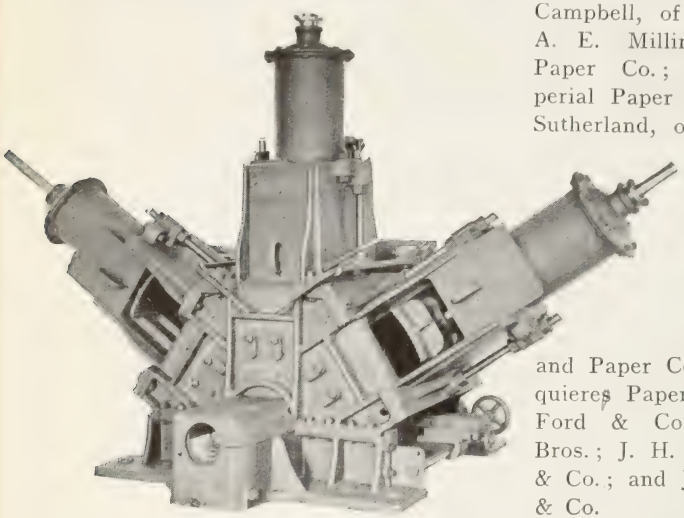
The Dix Foundry and Machine Co., of Glens Falls, N.Y., whose advertisement appears in this issue, is one of the modern builders of pulp and paper mill machinery in the United States.

Electric power is used in all departments, and the very latest in modern labor-saving tools are constantly being added to their equipment.

In May, 1904, Mr. C. B. Dix associated with him Mr. Clarence Fancher, formerly with several of the most prominent builders of pulp and paper mill machinery, since which time they have, and are now, enjoying a very successful business in this line.

Their new "Progressive Grinder" is attaining an enviable reputation for producing a maximum amount of pulp with a minimum amount of care and repairs. Its many good points, including its new valve and convenient and economical piping are best given in their specifications.

Their new "Progressive" wet press is an extra heavy, compact machine. Felt rolls are metallic, light, rust-proof, and interchangeable, and the heads do not become loose. One of the new feaures of this wet press is that when not required to bundle pulp it is



easily changed by a shift of the belt to a decker of the most modern type.

Their later pattern centrifugal pump has been given an extra amount of study and actual test, with the result of a high efficiency pump, with very little, if any, care required after installment.

Further particulars in regard to the above and to their other machines will be cheerfully forwarded, with photographs and blue prints, upon request.

PULP AND PAPER MANUFACTURERS' MEETING.

A general meeting of the Pulp and Paper Section of the Canadian Manufacturers' Association was held at the Windsor Hotel, Montreal, on the 15th, Carl Riordon, chairman of the section, presiding.

Among those present besides Mr. Riordon (representing the Riordon Paper Mills, Limited), were: George Cahoon and J. H. Acer, of the Laurentide Paper Co.; W. Hanson and J. E. A. Dubuc, of the Chicoutimi Pulp Co.; H. R. Erskine, of J. R. Booth, Ottawa; W. H. Rowley, of the E. B. Eddy Co.; George McDougall, of Jacques Cartier Paper Co.; H. Biermans, of Belgo-Canadian Paper Co.; A. McLaren, of James McLaren & Co.; Colonel Ackerman, of Ouiatchouan Pulp Co.; F. J. Campbell, of the Canada Paper Co.; A. E. Millington, of Spanish River Paper Co.; McFarland, of the Imperial Paper Mills, Sturgeon Falls; J. Sutherland, of Sault Ste. Marie Pulp and Paper Co.; O. A. Porritt, of Jonquieres Paper Co.; J. Ford, of Joseph Ford & Co.; W. Miller, of Miller Bros.; J. H. Munn, of Alex. McArthur & Co.; and Jas. Davy, of James Davy & Co.

The meeting was called to discuss. among other things, the attitude the Association should take on the question of the export of pulp-wood in case the United States Government should remove the duty from Canadian pulp. The result of the discussion was the adoption, by a unanimous vote, of a resolution declaring that in the interests of Canada the export of pulp-wood should be entirely prohibited as a measure for the protection of our forests no less than for the preservation of the water powers and for the upbuilding of Canadian industries.

The resolution was moved by Col. Ackerman, seconded by Mr. Cahoon, and it was decided to forward a copy to the Dominion Government.

On motion of Mr. Dubuc, seconded by Mr. Campbell, another resolution was passed, requesting the Dominion Government to appoint a Royal Commission to enquire into the effects of forest destruction upon the water powers and rainfall, and the effect of the prohibition of pulp-wood exportation on the manufacture of pulp and paper.

DRYING PAPER ON WEB.

In drying the web of paper, it is very important that the drying surface should correspond to the nature of the web. The grinding of the pulp in the hollander, and the action of the couch roll may be regulated with the utmost care, and yet the result may be defective if the drying apparatus is too small. The larger the drying surface, in reason, the better the finished paper, and the greater the economy of steam. The paper generally reaches the couch rolls with a content of from 40 to 50 per cent. of water, and should leave the machine finally, not absolutely dry, but in air dry condition. Further drying is wasteful, as over-dried paper will absorb moisture from the air. Few substances are more hygroscopic than paper. The final drying shrinks the paper, and the drying cylinders must be arranged to neutralize this. If the paper has to be dried with few cylinders, its passage through them must be rapid, and their speeds of revolution must be so adjusted as to give the necessary tension to prevent shrinkage.

In proportion, however, as the drying surface is increased, the shrinking between any two cylinders will be less, and hence the tension of the paper need not be so great, and there is not so much risk of injuring it. The best drying apparatus then consists of numerous cylinders, whereby the maximum of drying surface is secured. There is another disadvantage attending rapid drying, viz., that the heat has to be greater, whereby the paper is often made brittle and hard. It need hardly be said that sudden strains caused by irregular driving must be carefully avoided.

As regards the method of heating the drying cylinders, if live steam is used, the paper should be only gently heated at first, the hottest cylinders coming last. If exhaust is used, this precaution need not be observed, as then uniform heating of all the cylinders is readily attained.

The drying felts must be stretched quite smooth, or the calendering results will be unsatisfactory. The first cylinder should have a cotton felt, which warms the web very perfectly as it retains the steam from it in considerable quantity. Woolen felts on the first cylinders are too rapidly worn out by the contact of the damp paper web, and soon cause unequal drying. If live steam is used, the hottest cylinders must have a wooden felt as they extract the last residues of the moisture better than cotton. In heating with exhaust care must be taken that it is separated from engine oil before reaching the drying cylinders.

The cylinder doctors must receive much attention, especially as regards keeping them perfectly clean. The scraper must be at a uniform distance from the cylinder throughout its whole length, and must be of exactly the right degree of sharpness. It must be so adjusted in the narrow space between the cylinder and the case which encloses the latter that there is no fear of it touching the interior of case or of being too far from the paper. The best material for doctors is bronze, and if any accidental contact occurs between the scraper and the cylinder casing, it is the former that suffers. It is perhaps unnecessary to say that the temperature at which the drying is conducted requires careful attention.

To prolong the life of the felts the use of felt dryers cannot be too much insisted on. If this precaution is neglected, it is not uncommon for an expensive felt to become useless after a month's work. If the felts are left always damp, they always become mouldy, while the machine is standing, and the fungi rapidly destroy the textile fibre. Their effect on the paper, too, is most disastrous when the machine is restarted.

If by any chance the web should be torn, so that the felt comes into contact with the heated cylinder associated with it, the heating must be at once stopped until the machine can be restarted. The contact just spoken of shrinks the felt, and if it does not make it give way, makes it too stiff and hard for further use.

The use of cotton felts removes the necessity for felt dryers to a very great extent, and American paper machine engineers take full advantage of this fact.

In using live steam, there is far greater economy with large than with small drying cylinder sets. With a small group of cylinders, the rapidity with which the goods have to be passed through requires steam up to twenty-eight pounds per square inch, while with a large group, seven pounds or even three pounds may be quite enough. It is important, whether live or exhaust steam is used, that the cylinders should always contain some condensed water. This water not only supplies some of the heat, and hence saves steam, but it is a most valuable preventive of overheating.

The output of a drying apparatus depends upon many circumstances, especially on the character of the pulp passing over the wires, i.e., upon the less or greater amount of water present after the web has left the couch roll. Size, too, has a great influence. Generally speaking, all sizes hinder the drying of the paper, but gelatine and mineral fillings are the worst of all. It is not only a question of the amount of water which reaches the drying cylinders, but of the greater or less pertinacity with which it is held by the web. If the drying is difficult it is impossible to get a good result except by using a very large drying surface over which the web is passed as slowly as circumstances will allow.—Paper-making.

ORIENTAL MARKET FOR CANADIAN PULP.

Returning travellers from the Orient point out the opportunities which exist for the sale of Canadian pulp in both China and Japan and it is considered that British Columbia, rich in pulp timber, could secure an immense trade in the Oriental countries. The demand for paper, especially for news print is said to be vast, especially in China, where every centre of population in the teeming country, has its newspapers, which are increasing in number by hundreds of late. It is only within the last two years that the native newspaper publisher has entered most of the walled cities, and with the vast circulation of the native journals in the densely populated empire there will be a rapidly growing demand for both pulp and paper.

W. T. R. Preston, Canadian trade commissioner for China, Japan and Korea, in a recent report to the Ottawa Government states that the Japanese are among the oldest paper-makers in the world. It is not surprising therefore that they should have made expeditious facilities afforded for the manufacture of paper by the aid of Western appliances. The expansion of this business in Japan is shown by the phenomenal increase in the import of wood pulp for the manufacture of paper, as may be seen from the following figures:

Year.	Kin.	Yen.
1987	1,433,968	63,787
1898	6,948,497	223,590
1899	6,588,197	336,615
1900	6,707,118	455,130
1901	3,007,994	205,590
1902	6,268,937	365,058
1903	12,125,560	627,139
1904	17,180,298	855,570
1905	17,213,418	1,047,290
1906	27,987,171	1,764,002

Germany is credited with more than two-thirds of the entire pulp imports of Japan. But while it appears to be so from the official records, in point of fact the great bulk actually comes from Norway. The pulp is handled by Hamburg merchants and carried by German ships. Formerly the main customer for the pulp carried by German vessels was the United States, which market is said to have been largely exploited by the Canadian manufacturers of pulp, thus replacing the German trade. Since the Hamburg merchants found competition by Canada too keen for them in the United States they directed their attention to the Far

East, with the results that have been already indicated.

In the early history of the Japanese pulp industry the wood product was used altogether for the manufacture of what is known as foreign papers. But now there is an ever increasing demand for this raw material for the manufacture of Japanese papers. It has been found that by a proper mixture of the wood pulp with the ingredients usually used for manufacturing Japanese paper, a much cheaper manufactured product is available, and at the same time the peculiar fibre of the Japanese paper is not eliminated. From that standpoint it is fair to believe that the demand for wood pulp will increase very largely within the next few years.

On the other hand, it may be said that a combination of prominent paper mills has secured an important pulpwood concession in the northern part of Japan. The manufacture of wood pulp will shortly commence in the district on a large scale, the product being, of course, for use in their own mills. The factories are now approaching completion and are being fitted with all the most improved machinery. It is possible that for a time these circumstances may disturb the market for pulp in the East, but it will only be for a limited period. There are many paper mills that are not interested in the concessions in question, and as they are prepared to enlarge the scope of their operations, an active demand will continue for the supply of foreign wood pulp. The manufacture of paper will expand enormously, keeping pace with other lines of manufacture during the next few years. This fact will naturally have a tendency to steady the market notwithstanding the local production of pulp.

The value of the produce of the Japanese paper mills in 1907 was:

Japanese paper . . . . ..Yen 13,722,000
European paper . . . .Yen 11,059,000

The import of European paper in 1905 amounted to Yen 6,380,000.

The import duty levied on wood pulp for manufacturing purposes at present is yen 0.250 per kin, which is equivalent to Yen 0.094 for 100 pounds.

It might be interesting to know that the Japanese manufacture a very good pulp from rice straw, and which is equal to the best chemical wood pulp for the manufacture of European papers. But, unfortunately, the expense attending the manufacture of this pulp makes the product much higher in price than foreign or imported wood pulp referred to. Experiments are being made with a view of reducing the cost of manufacturing the rice straw pulp.

In the Japanese paper mills at the Ehime Prefecture, they are now experimenting with pulp manufactured from waste wheat straw. This product is used in the manufacture of Japanese paper, being mixed in the process with materials known as "Kozu" and "Mitsumata." The writer is not aware whether any efforts have been made to utilize the vast waste wheat straw of the Western pro-

FOR SALE

One second hand revolving rag boiler, in first-class condition, driving gear and all complete, Dimensions : 6 feet diameter by 25 feet long, with 2 doors, working pressure 50 pounds per square inch. For price and further particulars apply to the Cornwall Paper Manufacturing Company, Mille Roches, One.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

POSITION WANTED.

Superintendent open for Engagement.

A1 on Book, Bond, Blottings and Coating Stock 17 years experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc Address M. R. J. care Pulp and Paper Magazine, Toronto.

Position Wanted

A mill manager, having experience in the manufacture of Kraft Brown both in Sweden and England, is open for an engagement with a Canadian mill. Is able to take charge of a paper mill as manager or assistant manager. Address "Kraft," c/o Pulp and Paper Magazine.

vinces in this way. This appears to open a more profitable field for experiments than the usual way of disposing of straws of the various cereals that are grown in such enormous quantities in Western Canada.

In respect to the Japanese market Canada labors under advantages as well as disadvantages. Dealers in wood pulp say that in ordering from Europe, scarcely less than ninety days elapse from the date of the transmission of a cable order to the arrival of the pulp at a Japanese port. As has already been stated, the pulp comes from Scandinavia and is transferred to German ships at Hamburg.

But while Canada may enjoy a great advantage in point of comparative proximity to the markets of the Far East, this is more than overcome by the very cheap cost of transportation from the European ports. Freight charges on pulp from Christiana (Norway) to Yokohama do not exceed thirty shillings ($7.50) per ton, and sometimes a lower quotation can be secured, while from Hamburg to Yokohama, the cost of transportation of pulp varies from twenty shillings ($4.86) to twenty-five shillings ($6.08) per ton.

In December the price for pulp at Tokyo was four sen per pound, or Yen eighty per ton of 2,000 pounds.

The plain statements of fact in this report will enable Canadian manufacturers of wood pulp to realize in how far the Eastern market may be available to them now. In considering the question they may rest assured that the demand there for all kinds of pulp will increase enormously in each succeeding year, as Japan will not only be supplying the local demand, but will seek for other markets throughout the entire East, including India as well as China.

WIRE AND FELT MARKS.

Wire marks are less apparent the finer the mesh of the wire, but the composition and beating of the stuff also play an important part. The pulp should feel rather short and slimy, not long, thin and free. With the former condition of the pulp, the machine man will be forced to use less pressure on the couch roll, which is a safeguard against wire marking. The nature of the lower couch roll also has an influence on the marking. Latterly there is a growing tendency not to leave this bare but to cover it with a jacket; an old, worn jacket is, however, useless.

The suction boxes fix the impression of the wire, but for practical reasons it is not advisable to reduce their suction below the ordinary. Chromo papers are almost unusable when they show a wire mark. For these sorts the smoothing rolls between the first drying cylinders, which flatten the paper while it is still wet and plastic, are of great benefit. A drawback of this piece of machinery is that it requires the pulp to be absolutely clean and highly refined, since knots, which would pass, perfectly well in the ordinary way, are squeezed out in the Tittel press to unsightly streaks.

Felt marks depend first on the texture of the felt, and secondly on the condition of the pulp and its preparation. While wire marking is sought to be avoided by wet beating and light couching, the danger is lest the softer paper thus coming to the presses should be more susceptible to take impressions of the felt. The best way of avoiding this evil is to use a closely woven felt made of fine wool fibres and loosely twisted yarn. Further, when making fine papers, too much work should not be thrown on the felt at one time by pressing too strongly; the water must be taken out gradually and two pairs of press rolls are not sufficient. Naturally, with a free beaten pulp, with which heavy couching is permissible, the tendency to felt markings is not so great and felts of a coarser texture may be used. Old, worn felts show the greatest tendency to marking. Sometimes a felt marked surface is specially desired, in which case the presses are fitted with a marking felt. If fine repped lines are wanted the marking felt is put on the first press, if coarser lines are required, it is put on the second or third.

PULP FLAKER.

William Angus, of Montreal, Quebec, Canada, has been granted United States patent No. 868,063, on a pulp flaker.

The invention relates to the treatment of the sheet pulp, as it is fed from the wet machine upon the felt, and it has for its object to break the sheet pulp into flakes for drying purposes.

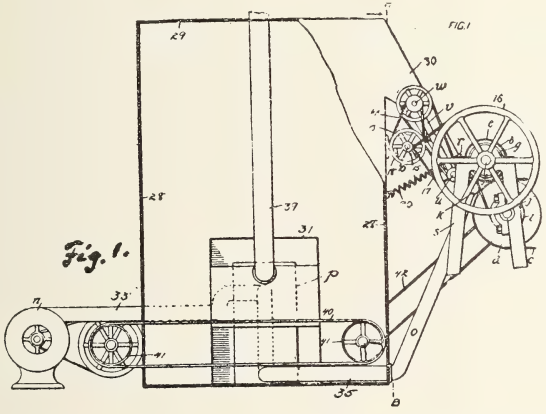
The invention may be said briefly to consist in providing means for breaking the sheet pulp into fragments without injuring the fibre thereof by acting upon the edges only of the portions thereof constituting the fragments.

More specifically speaking the invention may be said briefly to consist in mounting one or more combs adjacent to a take-up roll for picking up the pulp from the felt, and operating same to act upon the sheet pulp, upon the take-up roll and detach fragments therefrom, said fragments being projected into a heated chamber wherein they are dried and from which said dried fragments may be fed to any suitable baling press or receptacle.

Fig. 1 is a side elevation of a portion of a wet machine with the invention applied thereto; Fig. 2 is an enlarged transverse vertical sectional view thereof taken on line A, B, Fig. 1, looking in the direction indicated; Fig. 3 a longitudinal vertical sectional view thereof taken on line C, D, Fig. 2; Fig. 4 is a detail perspective view of the improved flaking roll removed, and Fig. 5 is a detailed longitudinal vertical sectional view of the heater.

The sheet of pulp carried upon the felt of a wet machine is of exceedingly loose texture, and so thin as to be almost transparent, and, consequently, is most delicate and fragile, and when in its wet state, as it lies upon the felt, is very easily broken into flakes or fragments; in fact, it is difficult to remove it whole, in a self-supporting way, from the felt.

The improved flaker, which is particularly adapted to breaking the sheet pulp, when in the above described condition, into flakes or fragments without injuring the fibre of the pulp, consists of a take-up roll b bearing on the felt c drawn from the wet machine (not shown) by



roll d. This take-up roll is preferably provided with a tight-fitting jacket e of textile material, and it is mounted rigidly upon a shaft f, having a pair of pulleys g rigidly upon the opposite ends thereof and driven from pulleys i upon the shaft h of the felt roll by bands j.

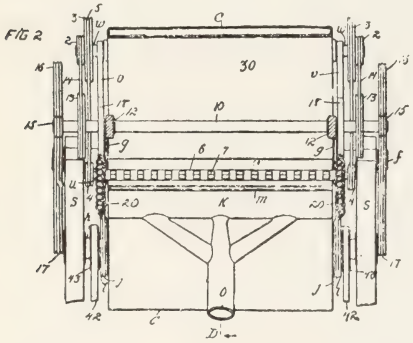
A blast pipe k extends transversely of the take-up roll in a position to have its mouth m face in a direction tangential of and a short distance from the surface of the take-up roll, this blast pipe being fed from a blower n through a pipe o which passes through a furnace p to be presently further alluded to.

A baffle-plate q deflects the blast from the take-up roll, and a strip or knife r,

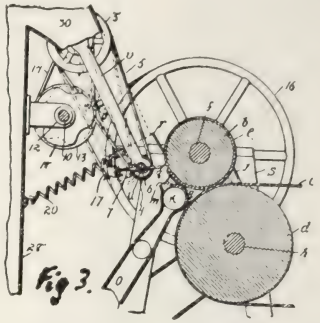
constituting a doctor, doctors the sheet pulp off the take-up roll under certain conditions. This doctor and the baffle-plate are supported by a frame s.

A swing counter shaft u is rotatably mounted in the lower ends of a pair of arms v between which it acts as a stay, and the upper ends of said arms are pivoted preferably with a pair of stub-axles w which may be carried upon the wall of the drying chamber to be presently described. Upon each of these stub axles and outside of the arms v is rotatably mounted a duplex pulley 2 and 3, and upon each end of the counter shaft u and also outside of the arms v is rigidly mounted a pulley 4, while bands 5 operatively connect the portions 3 of the duplex pulleys to the pulleys 4.

A roller 6 is mounted rigidly upon the counter shaft u and is provided at dia-

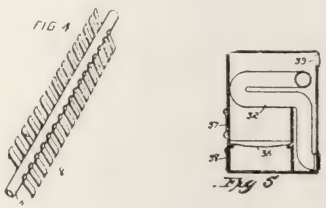


metrically opposite sides with a pair of combs 7 and 8, respectively, the teeth of one comb being in the circumferential plane of the spaces between the teeth of the other, and the ends of the teeth of each are preferably bent towards the direction of rotation of their carrying roll and slightly sharpened. A second counter shaft 10 is rotatably mounted in bearings 12, also preferably upon the drying chamber, and has a pair of pulleys 13 rigidly thereon one in line with each of the portions 2 of the duplex pulleys to which they are connected by bands 14. A pair of small pulleys 15 are mounted upon the edge of this shaft in line with a pair of large pulleys 16 upon the shaft of the take-up roll and which are connected to said small pulleys by crossed bands 17; while a pair of three-throw cams 18, which are secured rigidly upon said last mentioned counter shaft and in line with the swinging arms



v, impart an oscillatory movement to the arms, anti-friction rollers 19 upon the arms receiving the thrust of said cams, and retractile helical springs 20 yieldingly maintaining said anti-friction rollers constantly in engagement with said cams.

The drying chamber consists of walls 28 and top 29 and is preferably rectangular in plan view, and a duct 30 leads from within close proximity of the blast pipe to the upper end of said chamber and extends in width from end to end of said blast pipe, which is also preferably the width of the felt chamber. The chamber is heated by means of a stove or heater located in a small extension 31 which communicates with the interior of the chamber and said stove or heater is constructed with a zigzag flue 32 in



its upper portion, with one end of which a pipe 33 leading from a blower n, is connected, while a second pipe 35 leads from the opposite end of this zagzag flue to the blast pipe. The stove or heater

is furnished with an ordinary fire grate 36 and fire and ash pit doors 37 and 38, respectively, while the products of combustion after passing around the flue 32 are taken off by means of pipe 39.

A travelling table is located at the bottom of the drier and constitutes a false bottom upon which the flakes of dried pulp fall and whereby they are carried outside of the chamber. This travelling table consists of an endless apron 40 passing round rollers 41 driven by a belt 42 from a pulley 43 upon the shaft of the felt roll, said apron projecting through an aperture in the lower portion of one of the side walls.

The operation of my improved flaker is as follows: The take-up roll lifts the sheet pulp from the felt and winds it upon itself, and as the roll passes the point in the arc of oscillation of the rapidly rotating swinging shaft carrying the comb-roll, such comb-roll is intermittently moved by the cams to a position to have its teeth pass in close proximity to the face of the take-up roll, which action will cause the portion of the sheet pulp in advance of said arc to be flicked from said take-up roll first by one series of comb teeth and then by the other series, the intervals between the approaches of the comb-roll being of sufficient duration to allow one-half inch, full width of the machine, of the sheet pulp to pass the arc. The portions thus flickered off are in the forms of flakes or fragments, and are blown by the hot blast into the top of the drying chamber wherein the heat takes up what moisture is not absorbed by the blast and they fall upon the travelling apron which delivers them into any suitable receptacle.

The object in providing the doctor is to cause any portions of the sheet pulp not flicked from the roll by the comb teeth to be doctored off and caused to fall back into the hot blast the impact of which will flake said portion thus disengaged and precipitate the flakes into the drier.

When the sheet pulp is of excessive fragility the belt 17 driving the cam shaft can be shipped from either of its pulleys when the comb roll is in its position away from the take-up roll. The sheet pulp will then be doctored from said take-up roll and fall over the baffle-plate into the hot blast which will tear this portion of the sheet from the main sheet.

PULP AND LUMBER REFUSE.

To the Editor Pulp and Paper Magazine:

Sir,—I have read with great interest the Forestry edition of the Globe, March 4th, and think it covers nearly the whole field of discussion; the two items omitted that may be of consequence are in connection with waste left by present methods. (1) In felling trees a stump is left often containing a fair portion of valuable lumber (for pulp), and at the top there is often from 2 to 8 feet of available timber after cutting off standard lengths. Both of these can be saved by care in cutting in the woods. In cutting 210 thousands of pine on my homestead the jobbers (Indians) left at least 25 thousands that could have been saved by proper sawing, e.g, a tree that would make 20 to 28 ft. trunk, take one 16 ft. log, leave 2 ft. on stump (to save bending while sawing), and 6 to 12 ft. in top to save cutting branches. (2) Trees cut down and left for slight defects that cull them on the jobber, but would pay as lath or shingles if taken to the sawmill. I have seen a berth cut entirely by jobbers where probably a million feet was cut down, some skidded up, and all left, because they would cut down the average profit of the contract. But what of the loss to the country and licenseholder? (3) The tops of pine and all trees felled in getting it down are not only wasted but endanger the standing timber when dry, and are a great nuisance to the settler, who derives no benefit from the lumbering, but has all the trouble and inconvenience of removing the debris. (4) As the licenseholder buys only the marketable timber at the time of purchase he is not entitled to the growth maturing after he has cut his

crop. Some berths have been cut over three or four times, as prices rise, and are now held at much higher prices than he paid for the virgin cut. All old berths should be resumed and the future growth inure to the country as well as the original growth has done. In future licenses (if any are granted) there should be provision for destroying all waste timber—a better, utilizing all wood felled, either as pulp, shingles, etc., or burning it at suitable times to remove menace of fire. All berths resumed should be put under competent foresters, who would locate settlers on purely farming lands, and use them as assistants in fighting fires when necessary. All future cutting of timber or pulp-wood should be done under Government direction, for the public benefit, and private interests terminated. Only by large national co-operation can our forest wealth be adequately preserved and administered.

In the 140,000 square miles added to the area of Ontario by the partition of Keewatin we have an excellent opportunity to begin aright, on best forestry principles, in the conservation of our virgin forest wealth; and at the same time afford a field for the employment of our young foresters, as rapidly as they become competent.

In the reforesting of all the waste places in older Ontario much good will be done both to the farmers, and incidentally, in the inculcation of correct arboreal ideas in youthful minds. Planting trees to commemorate marriages, births, and deaths in rural life, will literally keep their memories green longer than by any other method. A willow staff left in the mud of a wayside spring on Dundas Street sprouted, grew, and was a magnificent shade tree when I taught in Halton. A row of beech saplings planted by a Scottish settler across the front of his farm in 1845 is now the finest ornament in the county. Then it will instill in youthful minds thoughts of the flight of time, our duty to posterity, the blessing of shade, and many other elevating ideas. Plant a grove round every school garden and make it a living lesson for generations.—Homo Senex Sylvarum.

THE PAPER MILL DIRECTORY OF ENGLAND, SCOTLAND AND IRELAND, 1908.

The above book has been issued by Simpkin, Marshall, Hamilton, Kent and Company, Ludgate Hill, London, Eng. This is the forty-eighth annual edition and at half a crown is a very cheap and compact handbook of the paper industry of Great Britain. It also contains a list of the trades of London and the wholesale stationery and paper stainers of England and Scotland.

PAPER-MAKERS' ASSOCIATION OF GREAT BRITAIN.

The annual general meeting of the Paper-makers' Association of Great Britain and Ireland (incorporated) took place in London on the 27th ult. H. W. T. Garnett was in the chair. Sir John Evans, K.C.B., F.R.S., was re-elected president; Capt. Ed. Partington, J.P., vice-president; Geo. Chater, honorary treasurer; C. Corbridge, auditor.

The recommendation of the sub-committee to adopt rules for sampling and testing wood pulp for moisture, as agreed on at the recent conference, was confirmed. The committee had made out a list of approved chemists, a step which would do much to bring the testing to a correct standard.

In the evening there was a banquet, at which many prominent men made speeches of interest to the paper manufacturers present.

—The United States Congress has appropriated $10,000 for the purpose of making investigations to determine whether raw materials other than those now used in the manufacture of paper cannot be found.

MODERN PRINTING PAPERS.*

No apology is needed for introducing such a subject to the notice of librarians. The wonderful growth and development of the art of printing has been one of the prime factors in drawing attention to the necessity of studying paper, though we cannot forget that keen competition, coupled with a somewhat senseless pursuit after cheapness, regardless of quality, has had much to do with it. The modern conditions of printing have resulted in developments in papermaking, partly along the lines of improvement in quality, but mainly in the direction of the manufacture of a cheap article for common daily and weekly newspapers, or an artificial substance required for certain methods of picture illustration.

One writer, with an eye evidently keener for an epigram than the truth, says, "the consumption of paper is the measure of a people's culture." The librarian is in a good position to judge the real truth of this statement. If the following figures are any criterion of our intellectual attainments there is little to complain of:—

Paper made in the United Kingdom, (A. D. Spicer).

1800	11,000	tons.
1850	63,000	"
1900	651,000	"

This wonderful increase in the amount of paper produced is due to a variety of causes, amongst which may be mentioned the repeal of the duty on paper in 1860, the introduction of fibres other than rag, and the spread of education.

This history of the modern printing paper is closely connected with the introduction of photo-mechanical processes of illustrating. The ingenious application of the art of the designer for commercial purposes in the numerous weekly and monthly magazines, and in advertisement pamphlets, has created such a demand for illustrations that no books are acceptable without them.

The wood engraving, the copper etching, the photogravure, the collotype, the lithograph, and the half-tone process each represent a stage in the development of printing to which the papermaker has been compelled to give his serious attention.

The quality and constitution of paper has of necessity been varied to meet these conditions, and also to satisfy the often unreasonable demand for something "cheaper." Possibly the skill of the papermaker in manufacturing a "novelty" which looks like paper, feels like paper, and sells like paper may account for some of the stuff that goes to make a book. He relies, perhaps, on the publisher's taste.

It must not be forgotten that the consumer can get as good a sheet of paper to-day as his grandfather did, if he pays the proper price, but it is absurd to ask a papermaker to sell a high-class article at a low-class price. If the consumer knew something of the conditions of manufacture he would quickly realize this, and thus the technology of paper is obviously a matter of considerable interest. The quality and value of most commercial articles is judged by other means than mere appearance and feel. Not so, paper.

A brief description of the process for converting rags into paper may serve as an introduction to a study of some of the technical difficulties connected with the use of it. The rags are carefully

*A lecture delivered by Mr. R. W. Sindall, F.C.S., before the Library Association, at Glasgow.

sorted into various grades, cut up into small pieces by hand or machinery, and boiled for some four or five hours in a closed vessel in a weak solution of caustic soda. They are then washed, partially broken up in suitable machines and bleached. After bleaching, the rags are "beaten" or thoroughly disintegrated into small fibres, the process of beating as will be shown presently, exercising an important influence on the nature of the paper finally produced. The finely beaten "pulp" is colored to the required extent, and made into paper on the paper machine, though for high-class paper the pulp is made into sheets by hand.

The pulp runs on to a horizontal endless wire cloth, and the large quantity of water mixed with it escapes through the meshes of the wire, leaving a thin wet sheet of paper on the upper surface of the wire. This sheet is passed through rolls which serve to take out more of the water and compress the fibres. The paper is dried by steam-heated cylinders, and finally glazed or polished by means of calendars. Good papers are sized with gelatine, being passed through a vessel containing a solution of gelatine, commoner qualities being also sized with rosin size, which latter material is always added to the pulp during the process of beating.

There are numerous modifications in the process which cannot be dealt with here.

The nature of the finished paper is determined by several factors, the chief of these being that known as "beating." The fibres are in this process submitted to the action of long knives, some of which are fixed in a narrow box, and the remainder on a revolving cylinder. The distance between the two sets of knives can be altered at will, and the knives may be sharp or blunt. The condition of the beaten pulp can be modified to an extraordinary extent, by varying either the sharpness of the knives, the rate at which the distance between the knives is altered, or the time occupied in beating.

If the fibrous material is beaten quickly with sharp knives, a pulp is obtained from which the water drains away readily, yielding a comparatively soft spongy paper. If on the other hand the beating is effected with blunt knives, and occupies a long time, the pulp acquires the power of retaining a certain proportion of water, and the paper is harder, semi-transparent, and exceedingly tough.

The strength, bulk and surface of paper are all influenced very materially not only by beating, but by the pressure of the couch rolls and the calenders of the paper machine.

The durability of the finished paper depends upon its freedom from traces of chemical impurities, and the care exercised in treating the fibrous material, so as to reduce it to a condition of pure cellulose, a term applied to the ultimate product isolated from cotton, linen, and other vegetable fibres by suitable chemical treatment. The addition of excessive quantities of clay and other mineral substances also lowers the quality. Small traces of acid, bleach residues, or chemicals used in the manufacture produce rapid deterioration, but these substances are seldom found in paper, as their action is now well understood.

Cotton and linen fibres produce the best paper, because in the raw state they exist as almost pure cellulose, and require but little chemical treatment for conversion into paper, and also because the ultimate fibre is long, and consequently allows of a greater variation of beating effect. In proportion as the fibrous material employed deviates from the condition of pure cellulose, so the paper suffers. For this reason the use of any mechanical wood pulp in paper is to be deprecated, since such material contains resinous and non-fibrous constituents which set up rapid decay.

The outcry about the deterioration of paper has only arisen of recent years since the introduction of other fibrous materials.

Esparto, a grass found in Algeria and Spain, is used in considerable quantity for magazine and book papers. It is converted into pulp by treatment with caustic soda under high pressure. It differs materially from the fibre of rag both in chemical composition and physical characteristics.

Wood pulp, now used in very large quantities, is produced in two forms, mechanical wood pulp and chemical wood pulp. The former is manufactured by grinding small logs of wood on a lagre grindstone which disintegrates it into fibres. This wood pulp enters largely into the composition of news and common printings.

The chemical wood pulp is a more or less pure form of cellulose obtained by digesting the wood in caustic soda or in a solution of bisulphite of lime. The large majority of printing papers are mixtures of esparto and chemical wood pulp.

If the percentage of pure cellulose and the absence of adventitious substances was the sole measure of the suitability of a paper it would be easy to define or suggest the composition of a standard printing paper. But such is not the case since quality and suitability are not synonymous terms. Owing to modern conditions of printing a paper inferior in quality may be more acceptable to the printer. In defining a standard paper, therefore, we are compelled to take into consideration the purpose for which the paper is intended. With the modern "art" paper, so-called, we have yet to find a substance which, containing a minimum percentage of non-cellulose constituents will give a maximum amount of detail in printing. We may illustrate the relation of quality to suitability by specific cases.

Many modern books are printed on paper which is very light and bulky, and as such books are pleasant to handle, this paper is freely used. The book will not, however, stand the wear and tear of daily use in a public library, for reasons for which it will be easy to appreciate. The paper is made from esparto, or from a mixture of esparto and wood pulp, the peculiar characteristics being imparted by special treatment. The material is beaten quickly so as to give a spongy pulp, and the wet sheet of paper passing over the paper machine is pressed very lightly, and dried cautiously. The dry paper is not polished or glazed. The result is a sheet of paper in which the fibres are not compressed closely together, or felted, to use a technical term. In fact, the nice-looking sheet is nearly all air space. The composition of such a paper expressed in terms of volume may be:—

Fibre	28.0
Air space	71.3
Loading	0.7
	100.0

The analysis of the sheet by ordinary methods proved this to be an esparto paper containing 10 per cent. of chemical wood pulp, and 4 per cent. of loading expressed in terms by weight.

It is not surprising that a paper containing such a large proportion of air space, and showing the lack of cohesion of fibres, is easily torn, and that in the process of rebinding, the pages of a book are readily split and broken. The disintegration of paper of this kind is obviously to be accounted for by a consideration of physical defects, and not chemical impurities.

The introduction of coated paper for half-tone printing has accentuated the outcry about the decay of the art of papermaking. We must frankly recognize that the heavy, highly polished material so much employed in modern magazine and books is not really paper. As a matter of fact it consists of a sheet of paper heavily coated with mineral matter, the amount of cellulose fibre being less than 50 per cent. The printer in his eager desire to produce pictures giving a large amount of detail uses a paper containing a maximum amount of

mineral coating and consequently only a small proportion of real paper. The object of a coating is to produce a dead level, even surface in order that a good impression may be obtained from a half-tone block. If such paper is examined under the microscope the nature of the surface can readily be seen.

The behavior of such papers when stored in a damp place, or when sent to the binder is too well known. In the first case the pages adhere together and the illustrations are ruined, while in the second case all attempts at sewing sheets of china clay meet with but partial success.

Apart from the difficulties experienced by printers and publishers in the use of art papers, we have to consider to some extent the aesthetic side of the subject. The sensation produced in holding a heavy book at an angle which will prevent a bright glare falling upon the eyes of the reader is not a pleasant one. The use of ordinary paper with a highly polished surface is therefore being largely resorted to in order to obviate this difficulty. The processes by which a smoothness of surface is imparted to ordinary paper are very ingenious. It is evident from examples already familiar to printers that if they would be content with a little less detail in the picture, the use of a heavily coated paper might be dispensed with.

The decay and discoloration of certain papers is due to a variety of causes, chief of which is the employment of mechanical wood pulp. This subject has been closely investigated by many experts, and one case may be quoted as showing the importance of this matter. As far back as 1887 the subject had attracted attention and one authority examined about 100 scientific and technical journals with the following astonishing result:—

A.—Rag papers with less than 2 per cent mineral matter	2
B.—Mixtures of rag and chemical wood with less than 5 per cent. ash	2
C.—Mixtures of rag and chemical wood, 5 to 15 per cent. ash..	31
D.—Mixtures inferior and containing ground wood	62
	97

While it may be a matter of congratulation that much of the literature of the present day is printed upon paper that will cease to exist say, in ten years, it is not easy to regard with equanimity the possible loss of valuable literature.

From what we have already said it will be conjectured that the difficulties relating to the binding of books has largely arisen from circumstances connected with modern developments in printing. Concurrent with the modified forms of paper which have been described we find altered methods of binding, so that weaker and inferior papers are submitted to mechanical methods of binding and sewing which are a severe trial upon the strength of the paper. All these facts taken together show that the whole subject is worthy of the serious attention of the Library Association, and it is to be hoped that this lecture will serve as an incentive to a complete and thorough enquiry. The filling of proper data must be the first step in any attempt to create a public taste for good paper.

It will be interesting to know the experience of the authorities at the British Museum in relation to this important question. How much of the money annually voted to the binding department is now used for re-making the book before binding. If an answer could be given to this question no doubt it would form a speaking testimony to the quality of the modern printing paper. Whatever answer is given to such a question it should be recognized that the papermaker is able to produce a printing paper of high quality, and with every assurance of durability, provided the publisher is willing to pay a reasonable price and is not too anxious to utilize eccentric substances misnamed paper.

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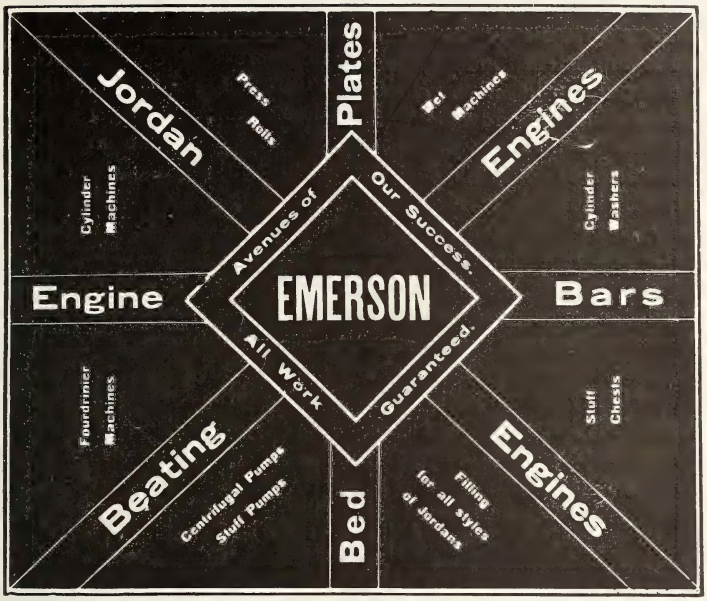

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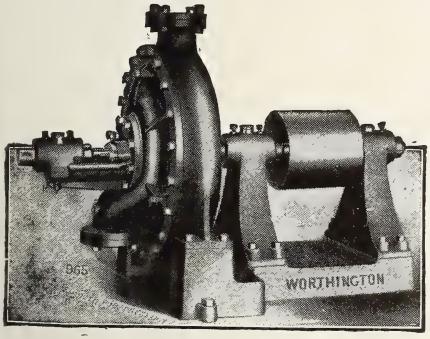

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THE MARKETS.

Toronto, April 18th, 1908.

Great dullness prevails in the pulp trade, to such an extent, indeed, that several of the pulp mills have closed down pending some improvement in conditions. The demand from the States for mechanical pulp is almost nil. In fact, conditions in this country are distinctly better than they are there. It is hoped that the coming of seasonable spring weather good seeding prospects, and the opening of navigation will favorably influence the market; and, indeed, there seems to be some slight tendency in that direction already, though it is but slight. Ground wood is quoted at about $20, though some has changed hands in the United States for less. Sulphite is quoted at $2, with little business passing. Some little improvement has been visible in the paper trade during the last few weeks, though less, perhaps, in Toronto than in some other parts of Canada. Sheet news sells at from $2.75 to $3.25, according to quantity, etc.; roll at $2.50 to $2.60. Strawboard has dropped to $30. filled to $35. Wrappings are a little firmer, but there is no change. Several provincial Governments will shortly be in the market for paper for new series of school books, and this will give a fillip to the demand for paper.

British Markets.—Greater activity and better prices are reported in the mechanical pulp market. Chemical pulp is steady, a large proportion of next year's output being already contracted for. The chemical market is quiet.

Norwegian Pulp Situation. — While there is some discrepancy of opinion expressed in the views of various mechanical pulp makers in Norway, the prevailing idea seems to be that the market is a shade stronger. Production has been more than anticipated, owing to the mild winter. Buyers have been delaying purchases until the last moment, with the result that stocks are pretty well depleted.

—Peter Morgensen, chief engineer of Chas. B. Pride, the pulp and paper mill architect of Appleton, Wis., and who has been in consultation with the directors of the British Canadian Wood Pulp and Paper Co., Limited, is enthusiastic regarding the future of Western Canada in the manufacture of wood pulp and paper. There is no question but that Western Canada is destined to become the leading producer of wood pulp and paper in the world, says Mr. Morgensen. It has long been the consensus of opinion of the leading forest experts of Europe and America that the hope and destiny of the world lay in the great north-west part of the United States and Western Canada. Here, like the lumber industry, it will make its last stand and produce the bulk of the future product. Here alone, he thinks, are the available forests upon which the industry can hope to subsist in the years to come.

—The Sandy Hill Iron and Brass Works of Sandy Hill, N.Y., U.S.A., are issuing a most attractive series of advertising literature regarding their pulp and paper mill machinery. They forward to each inquirer a binder to bind the various bulletins, and already three bulletins have been issued describing the Packer screen and the Ideal Fourdrinier paper machine. Additional buuletins will be issued, and all these will be gladly sent to Canadian manufacturers who are interested in watching the latest improvements in machinery.

—Most people in Toronto, and many in other parts of Ontario, who know the good work Thomas Southworth has done in every field in which he has so far been engaged, are sorry that he saw fit to withdraw from candidature for the Toronto Park Commissionship. Mr. Southworth, besides the progressiveness and sterling integrity required for such a position, has shown his capacity for organization, while, as for the technical knowledge required, Mr. Southworth is just the man to get it, or else to place his finger on the sources best available to supply it.

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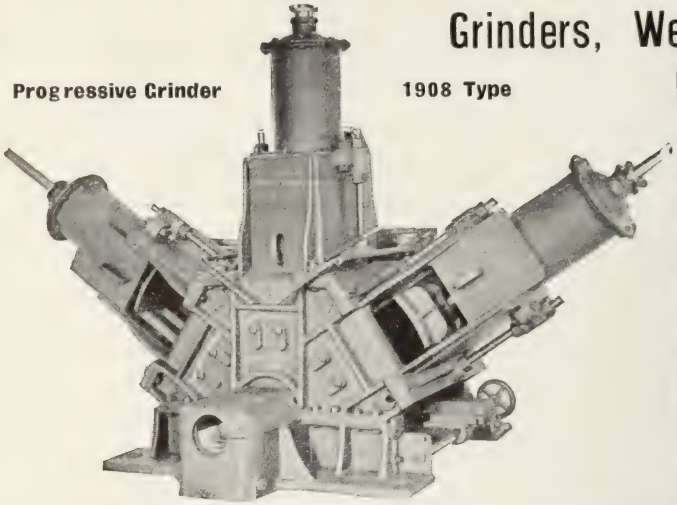

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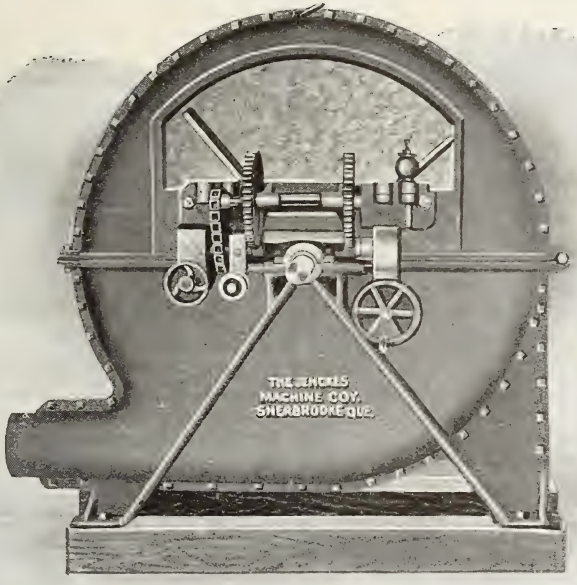

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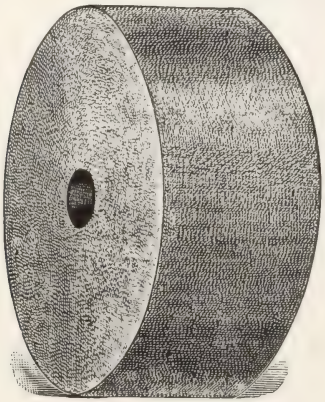

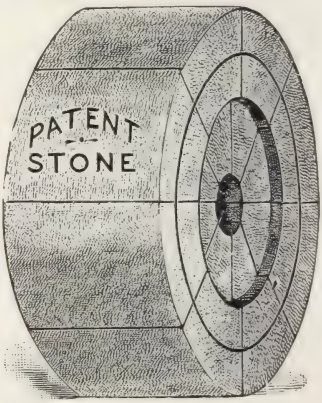

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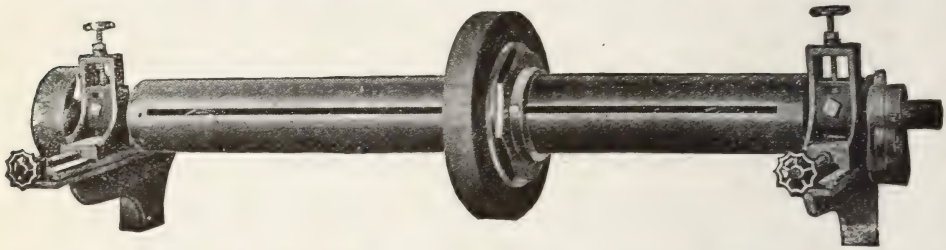

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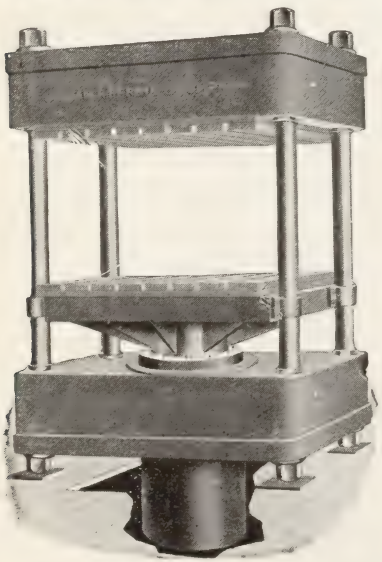

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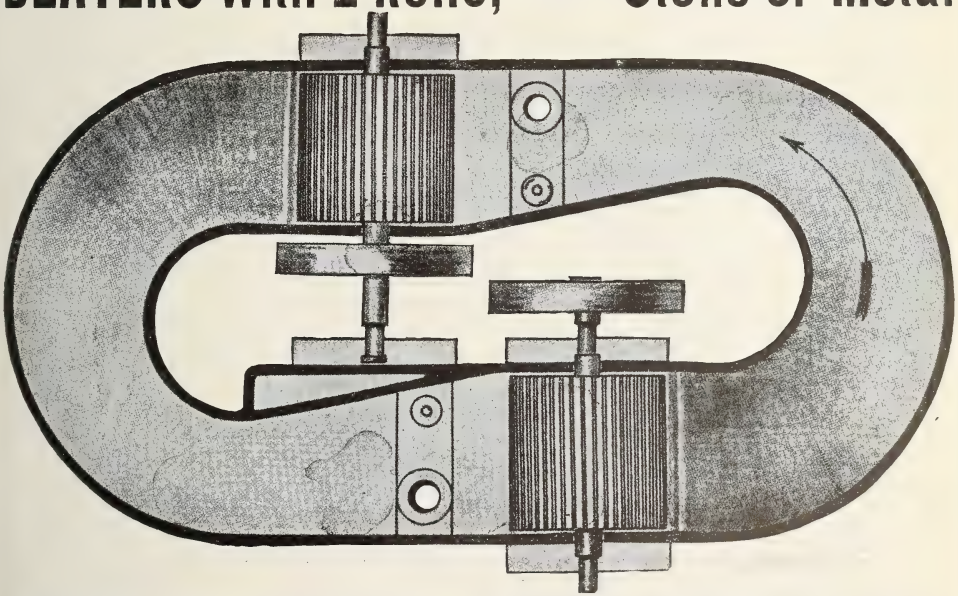

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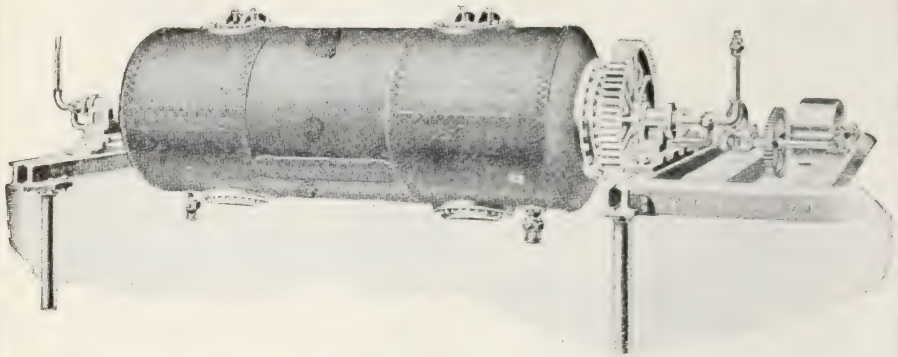

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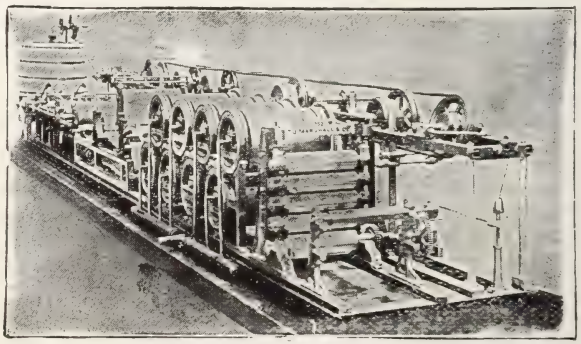

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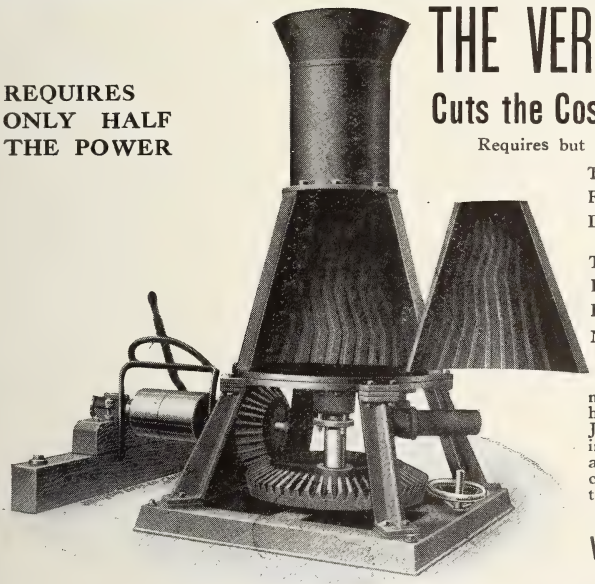

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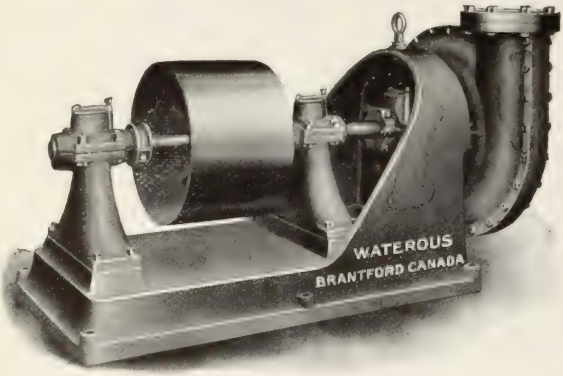

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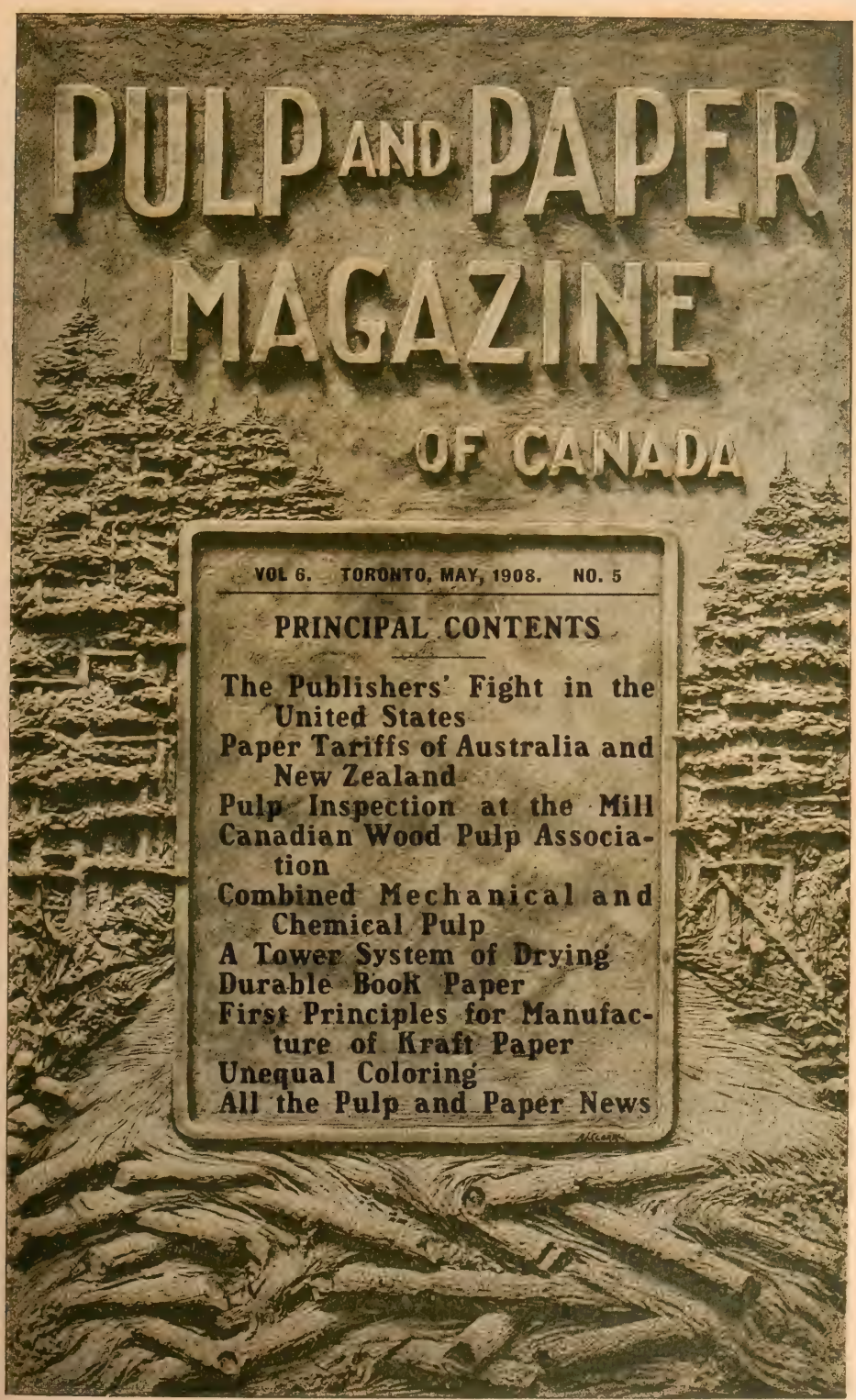

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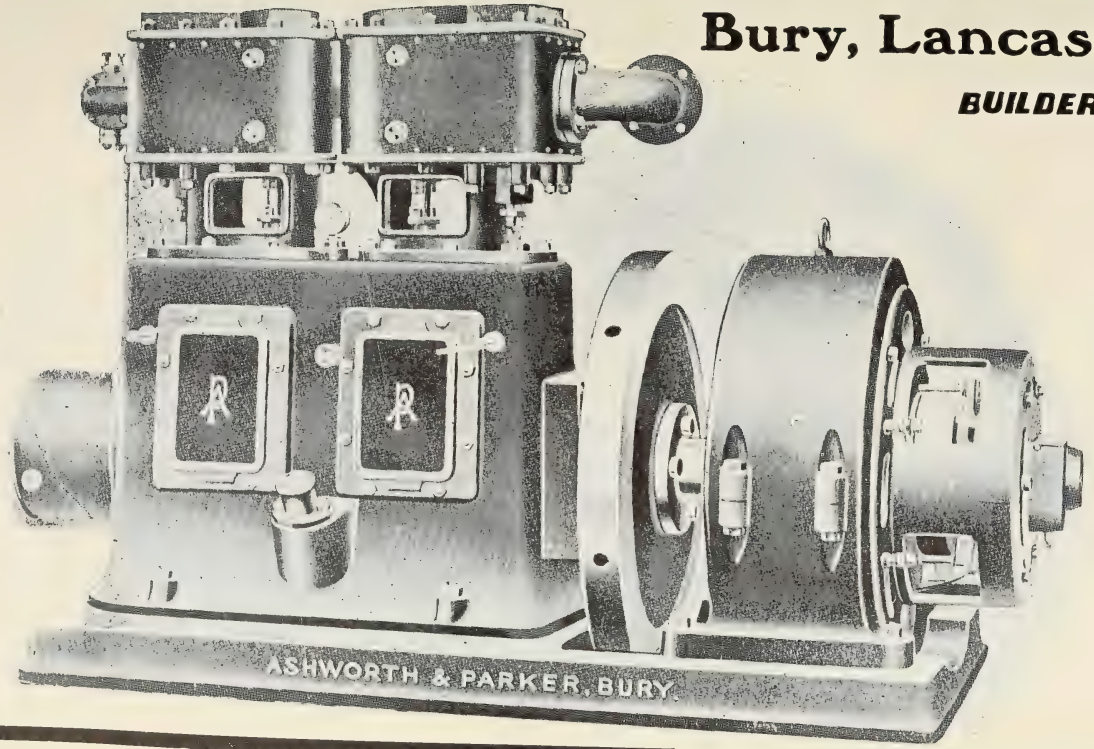

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WATER GLASS IN PAPER-SIZING.

Some German chemists have been studying the use of silicate of soda as a sizing material for paper. They have discovered that only two-thirds as much size is required when silicate of soda is used instead of rosin soap, provided that sulphate of alumina is mixed into the pulp, afterwards until the mass shows an acid reaction to litmus. This addition of sulphate of alumina forms a precipitate consisting of a mixture of the hydrates of silica and alumina in a state of intimate admixture with the pulp, and completely filling up all its interstices. This size also clings to the paper fibre with extreme tenacity, and increases the strength as well as the weight of the finished web. The inventors of the new size are well aware that it is not suitable for writing paper, as ordinary writing ink runs more or less on paper which has been sized by their process only; but they claim that it is eminently suitable for the preparation of every grade of printing paper, in which it gives results far superior to rosin-sizing at a smaller cost. Their paper does not become dusty when rubbed, as papers made with a rosin-soap size invariably do.

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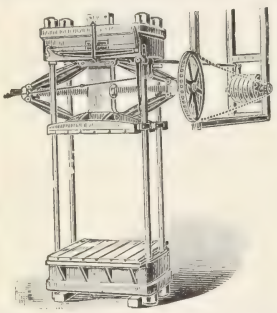

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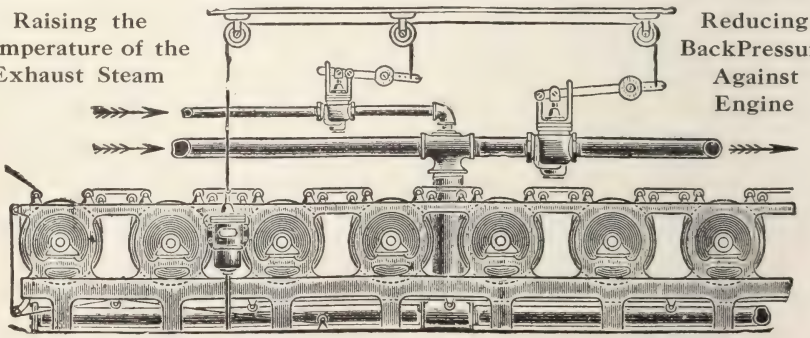

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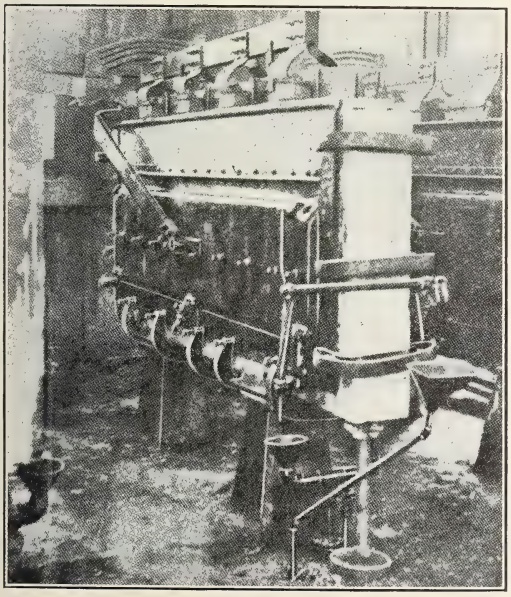

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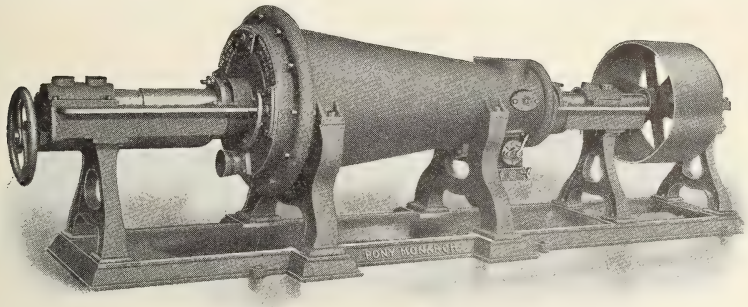

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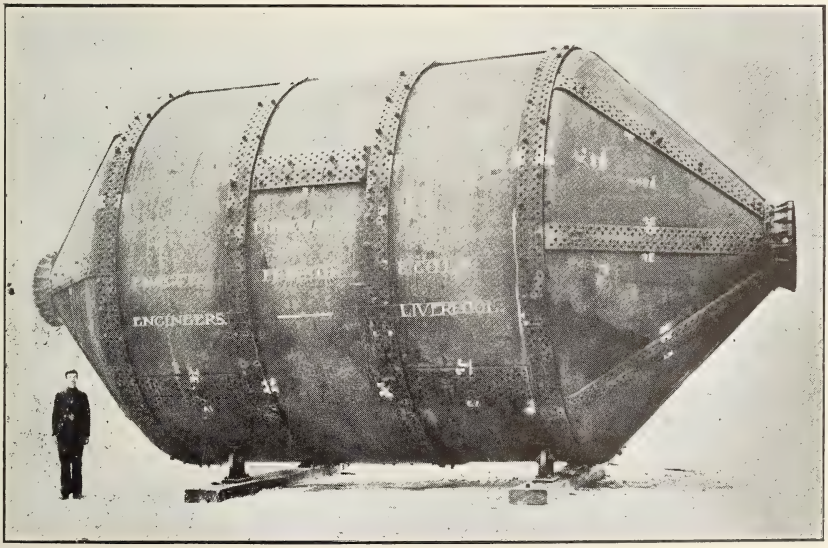

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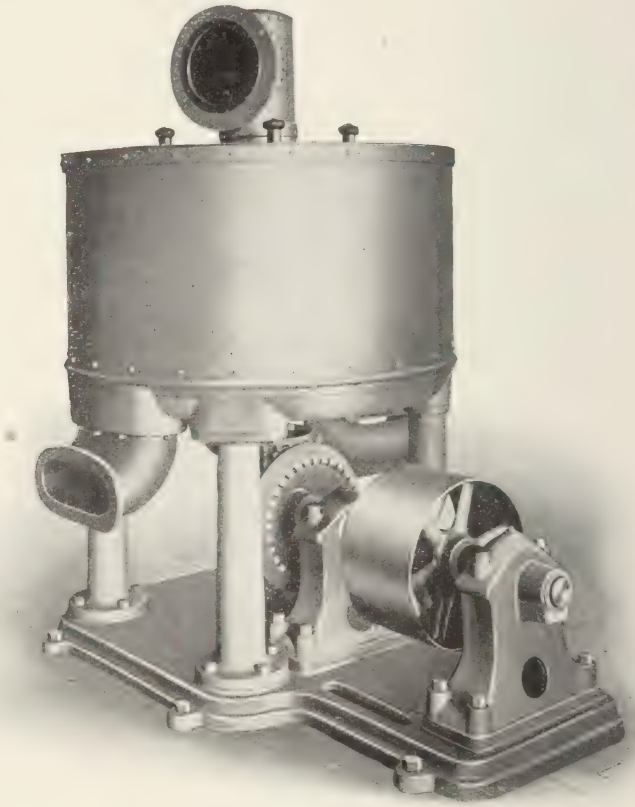

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LIME DEPOSITS ON STRAW PAPER MACHINE WIRES.

A correspondent recently sent in an inquiry for a cheaper method than the use of muriatic acid for the removal of deposits of lime from straw paper machine wires. In reply it is stated that lime can only be removed from wires by means of diluted muriatic acid, which, however, affects the wires. The employment of drilled wires is recommended, which are more durable for the manufacture of straw paper. The excess of lime must, however, be dealt with at an earlier stage by the introduction into the rotating straw boiler of a certain quantity of calcined soda, 11 to 13 pounds for a boiling of 1,000 to 1,540 pounds of straw.

If the boiler is provided with arrangements for washing, it is recommended to wash the contents thoroughly with clean water before emptying. If a washing hollander is available the straw emptied from the boiler should be again washed, until the lime is to some extent removed. The cost of the soda and of the washing is made up by the fact that the felts and wires remain much cleaner. The addition of soda makes the boiled straw much softer, this effect being still more evident when caustic soda is used in place of calcined. In washing the felts it is recommended to add some muriatic acid to the water.

In reviewing the question of cotton as compared with woolen felts, a writer in the "Papier-Zeitung" comments upon an assertion recently made that in the United States coarsely woven cotton felts are used, not only for news, but also in general for the manufacture of fine paper. The writer remarks that it might be supposed that European manufacturers had not paid sufficient attention to the subject, and were ignorant of the advantages claimed for cotton felts, as well as of their marked difference in price as compared with woolen felts. As a fact, it is stated a full test has been made in Germany of cotton felts in various weaves, with all classes of paper, but they have not been found to meet requirements of a high character, having only been adopted in the manufacture of printing and wrapping papers.

Cotton felts, it is remarked, leave marks which are more or less visible in all classes of paper, but which would cause in Germany the refusal of fine qualities. It is further considered impossible for the extensible cotton felt to make perfectly flat paper from cell-stuff. The American plan of stitching cotton felts together is likewise an obstacle to the production of flat paper, the same effect being occasionally noticeable in wool felts.

Half wool felts have, it is stated, been successfully introduced in Germany. These felts are said to be sufficiently open in weave to allow of rapid evaporation, possessing qualities of resistance equal to those of all-wool felts, being, moreover, 30 per cent. cheaper than the latter, and not causing the marks to which reference has been made.

THE PAPER MILL CHEMIST.

The object of this book, by Henry P. Stevens, M.A., Ph.D., F.I.C., is to provide in a neat and handy form all the necessary information for carrying out chemical and physical tests on paper or on the raw material used in the manufacture thereof. Data and tables useful for reference and of a kind required in all analytical and commercial purposes are also furnished. These tables in themselves contain the result of vast amounts of careful calculation and re-calculation, also of independent research, and are presented in a handy form, such as it would be difficult to duplicate in any other publication. Mr. Stevens acknowledges in his preface the valuable assistance rendered him by his colleague, Clayton Beadle. The book, which is illustrated, is published by Scott Greenwood & Son, London, and distributed in Canada by the Copp-Clark Co., Limited, Toronto.

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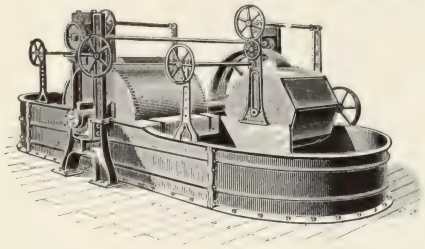

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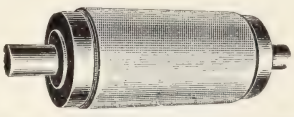

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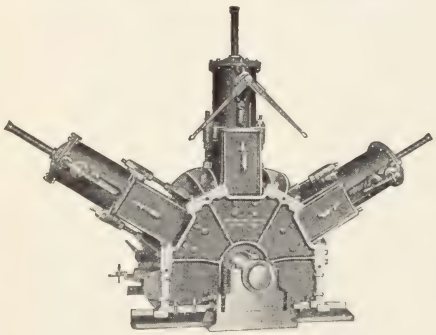

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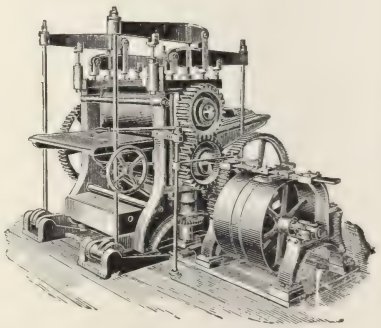

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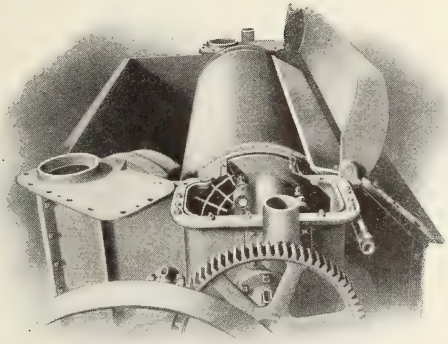

The new plant will probably be able to deliver Pneumatic Save-Alls in the early autumn. Meanwhile we are continuing to build at Ottawa, where our Save-Alls may be seen successfully operating in representative mills.

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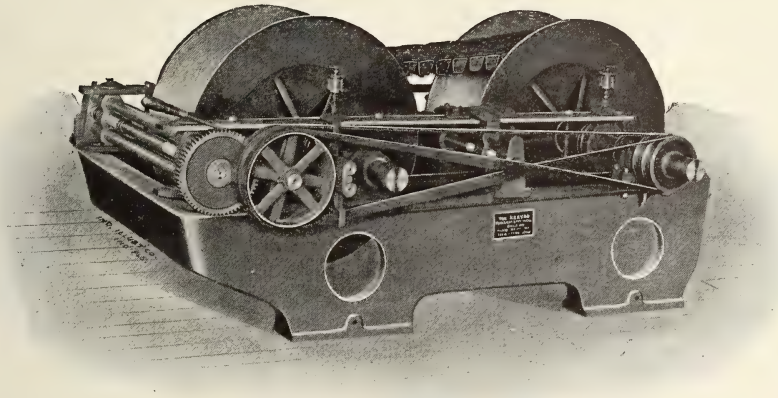

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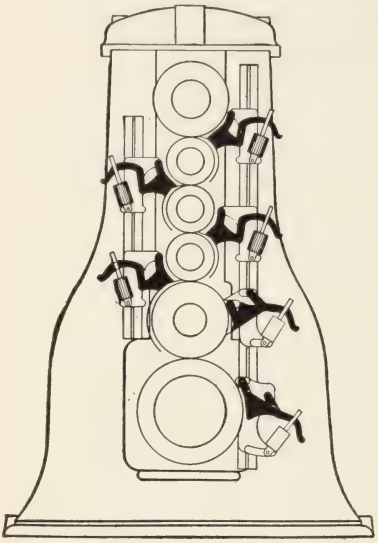

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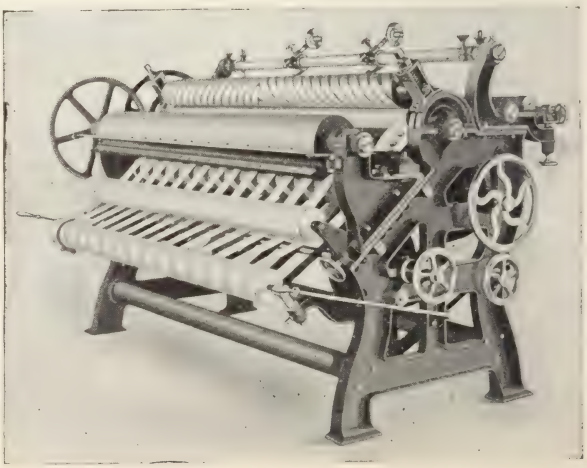

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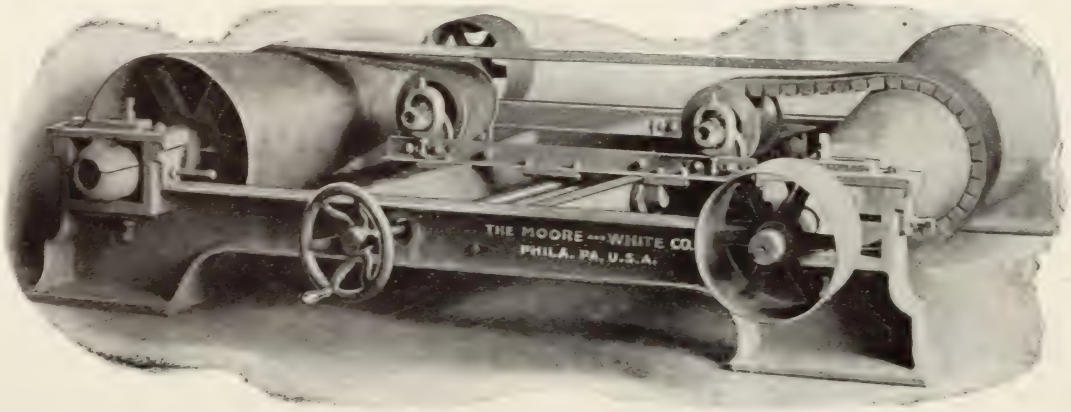

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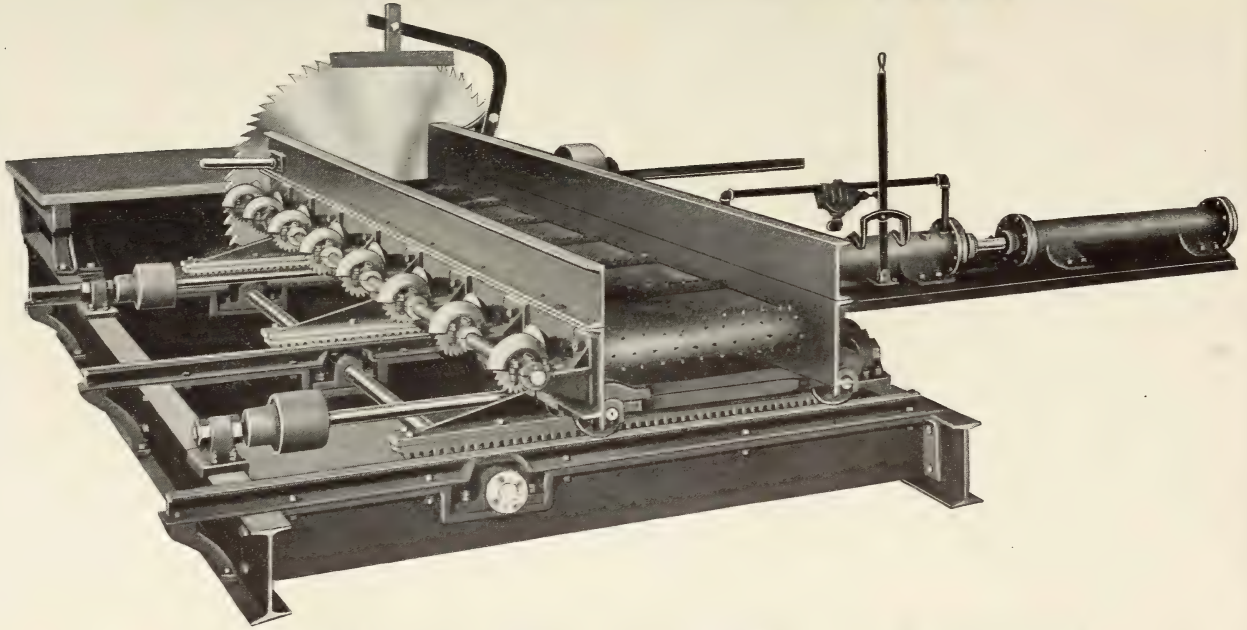

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THE PUBLISHERS' FIGHT IN THE UNITED STATES.

Months of hot argument by the publishers of the American one-cent newspapers have resulted in the appointment by the Ways and Means Committee of the United States Congress of a special committee of six to investigate the ~~truth of the~~ alleged existence of a combine among the manufacturers of paper, having the effect of artificially keeping prices high and in restraint of trade, as alleged by the former. Some of the clauses of the resolution which led up to the appointment of this committee were that the Publishers' Association claim that the cost of paper to the consumer is at least $60,000,000 per annum greater than it was two years ago, and that, under the price now asked the cost will be another $65,000,000 greater than heretofore; that this great advance in the price of printing paper is rendered possible by the duty of $6 per ton, and that the combination of print paper manufacturers in the United States has purchased the output of all the paper mills in Canada over that required for home consumption, said purchase being in furtherance of the conspiracy to restrain trade.

But, with the committee appointed, which apparently has been the desire of the publishers from the start, they are still far from being satisfied. The chairman has two or three times complained at the difficulty experienced in prevailing upon them to give facts and evidence as required, and as promised. And we note that at the meeting last month of the American Newspaper Publishers' Association, a protest was lodged against the proposed enquiry, as being a mere subterfuge, designed to throttle the Stevens bill to place paper and wood pulp on the free list.

Canadians, of course, have no objection to the United States Government rescinding the tariff duty on pulp and paper. Such an action would take one important restraint off the natural course of all industries; that is, to be carried on in the particular country

which, by reason of the possession of the raw material and necessary power, is especially adapted for the carrying on of that industry. Sooner or later, in any case, Canada's superior adaptability for the manufacture of pulp and paper will be recognized, and, the fluidity of capital being an old dictum of the economists, the latter will flow in in ample measure. But with free entry for those products into the United States, it will be as foretold in the words of W. B. Dillon, vice-president of the Great Northern Paper Co.: "Removal of the duty will do one thing, and that is, to transfer the bulk of the paper-making industry of this continent to Canada." Natural laws, we contend, will do this in any case; but there is no doubt that the abolition of artificial barriers across the line will do much to facilitate the progress of events.

Whether, however, the free entry of pulp and paper into the United States will result in all the benefit to themselves that the publishers fondly hope is open to question. In the first place, with the keen competition for news paper, would or could manufacturers of paper in Canada sell at a materially cheaper price than the publishers are having to give to-day? Secondly, how can a duty which amounts to, say, $6 per ton, be the cause of a $20 advance in the price of paper as the publishers allege?

Our concern is not so much the fiscal policy of the United States as the building up of our own pulp and paper industry and the preservation of our own forests, which means not only plenty of pulp-wood for future use, but the continuance of our water powers, with all that they imply, in connection with the needs of a great industrial nation. But, as to an outsider, it seems to us that, if the publishers find answer to their great outcry and succeed in getting paper put upon the free list, it will be the opening wedge for general free trade in the United States. Into the merits of the great standing interrogation—Free Trade or Protection?—we do not propose to enter. But as to the merits of this particular case, the publishers' attitude certainly seems rather anomalous. Many of those who are crying out loudest for free paper are the very ones who stand out most strongly for high duties on everything else. Paper is their raw material, but it is the finished product of the paper manufacturer. Why should the publishers alone be favored? Especially when the basis on which they are endeavoring to carry on their business is essentially unbusinesslike and unsound. A manufacturer of boots and shoes buys leather, his raw material; he puts a good deal of additional work into it, and he sells it for considerably more than the price of the material. He has no difficulty in getting that price, because the consumer knows it is worth it. The publisher of a newspaper is, or should be, exactly in the same position. Paper is his raw material; he puts, or is supposed to put, a great quantity of thought and labor into it, and then he sells it—for what? For one cent, or something less than the material on which it is printed cost him in the first instance. But why should he not charge the consumer for the extra work and care, just as the boot manufacturer does? The one and only possible reply to such a query, viz., that the public will not pay more than a cent for his finished product damns it instantly as a business proposition. For some papers they will and do pay more. And

presumably it is worth more than the paper on which it is printed, just as the shoe is worth more than the leather of which it is composed. The only recourse, if one cent is all that the public will pay for a certain newspaper, and if one cent will not pay for cost of production, is for it to take the cue and to go out of business. And in the end, the public interest would not suffer by having a little more quality and a little less quantity in the shape of reading matter thrown at its head, morning, noon, and night.

PAPER TARIFFS OF AUSTRALIA AND NEW ZEALAND.

The tariff of the Australian Commonwealth as now settled shows considerable reductions in many lines, and the pulp and paper trades are among those benefited. Canada is not yet in the charmed preferential circle, though we, no doubt, would have been there if our Government had taken a little broader view of this question and given all the British colonies the same preference as was given to Great Britain when the preferential tariff was framed, especially as our exports to the colonies were largely in manufactured goods, while our imports from the colonies were chiefly in raw materials and such manufactured articles as we could not make ourselves. However, an agreement with Canada is now under discussion.

The following are the chief items in pulp and paper in the Australian tariff, which has two rates, the general and the preferential:—

	General Tariff.	Preferential Tariff.
"News" paper in rolls or sheets	Free.	Free.
Wall paper	20 per cent.	15 per cent.
Strawboard paper	1s. 6d. per cwt.	1s. 6d. per cwt.
Paper bags	8s. 0d. "	7s. 6d. "
Paper (colored), parcel and bag	5s. 0d. "	4s. 6d. "
Pulp for paper	Free.	Free.

The tariff of New Zealand is arranged on the broad gauge principle of giving a preference to the Mother Country and all the British colonies without question as to whether a particular colony reciprocates. The following items relate to the paper and allied trades:—

	General Tariff.	Tariff on Goods the Produce or Manufacture of some part of the British Dominions.
Paper makers felts	Free.	Free.
Cigarette papers	"	"
Book-binders materials	"	"
Butter paper (known as vegetable parchment paper), and waxed paper, unprinted	"	"
Butter paper or waxed paper, printed.....per lb.	3⅜d.	3d.
Cardboard, pasteboard, wood-pulp board, and corrugated board, of size not less than that known as "royal," and weighing not less than 2 oz. per sheet of "royal" size; also strawboard of size not less than that known as "royal" and weighing not less than 3 oz. per sheet of "royal" size	"	"
Cardboard boxes, malerials for, viz.: gold and silver paper, plain or embossed; embossed paper in strips; gelatine or coloured papers; known as "box papers"	20%	"
Cartridge, drawing paper	Free.	"
Celluloid, plain, in sheets, not otherwise enumerated	"	"
Cloth-lined boards, not less than "royal" size	"	"

		General Tariff.	Tariff on Goods the Produce of Manufacture of some part of the British Dominions
Cloth-lined paper, and enamelled, gelatine, and metallic paper, of size not less than "demy," also "ivorite" of size not less than "demy"		Free	3d.
Copying paper, medium and larger sizes, in original mill wrappers and labels		"	"
Copy-books, having printed headlines on each page; also drawing books	ad. val.	10 %	"
Ink, printing		10 %	"
Masticated para		Free.	"
Millboard, and bookbinders' leather board		"	"
Paper, hand-made or machine-made, book or writing, when in original wrappers, of sizes not less than the size known as "demy," and not being a wrapping wrapper, or of the same quality as a wrapping paper		"	"
Paper, printing	ad. val.	20 %	"
Printed books, papers, and music, not otherwise enumerated, excepting advertising matter		Free.	
Sunday school tickets and reward cards, being scriptural or religious motto cards, not exceeding 5d. per dozen invoice value, and not exceeding 6 in. by 4 in. in size, and having no reference upon them to Christmas, New Year, Easter, or birthdays		"	"
Handbills, circulars, programmes, playbills, printed posters, trade catalogues, price-lists, and fashion-plates; printed advertising matter not otherwise enumerated; also paper bags, and wrapping paper or wrappers, of all kinds, printed or lithographed envelopes or labels. (This system shall not apply to trade catalogues or price-lists of the goods of firms or persons having no established business in New Zealand.)	Lb.	3⅝d.	3d.
Ink, writing	Gall.	3s.	2s.
Paper bags, coarse (including sugar bags)	Cwt.	11s. 3d.	7s. 6d.
Paper wrapping, all kinds, not painted, including blue candle, glazed cap, glazed casings, small hand, lumber hand, tissue, brown, cartridge, and sugar papers	"	7s. 6d.	5s.
Paperhanging		Free.	Free.
Cardboard, pasteboard, strawboard, woodpulp board, corrugated board, and cloth-lined board, not otherwise enumerated	ad val.	30 %	20 %
Cloth-lined, enamelled, gelatine, and metallic papers, not otherwise enumerated; also "ivorite" not otherwise enumerated	"	30 %	20 %
Stationery, and writing paper not otherwise enumerated, also printers' menu, wedding, programme, and mourning cards of card board, celluloid, or other material, edged or embossed, but otherwise unprinted	"	30 %	20 %
Calendars, and showcards, all kinds	"	37½ %	25 %
Cardboard, or paper boxes, complete; or cardboard or paper, cut, or shaped, for boxes, wrappers, or other receptacles (including match boxes)	"	37½ %	25 %
Paper bags, not otherwise enumerated	"	37½ %	25 %
Stationery, manufactured, viz :—			
Account books, manuscript books, scribbling, and letter blocks, and books, plain or ruled; bill-head, invoice, and statement forms; printed or ruled paper, counter-books, cheque and draft forms; tags, labels, not printed or lithographed; blotting pads, sketch books, book covers, copying letter books, manifold writers, albums (other than for photographs), diaries, birthday books, plain or faint-lined ruled books, printed window-tickets, printed, lithographed, or embossed stationery, not otherwise enumerated; and Christmas, New Year, birthday, Easter, and other cards, and booklets	"	37½ %	25 %

PULP INSPECTION AT THE MILL.

The manufacture of pulp has arrived in this country at a stage where, in the interests of both manufacturers and buyers, the services are needed of some kind of official tester, to inspect and test all pulp made. The problem of accurately determining the dry weight of any moist substance is one which, although apparently simple, may yet be very difficult, according to the chemical nature of the material and the symmetry of its composition.

A material such as coal, if heated to a sufficiently high temperature to drive off all of the moisture, will begin to oxidize and increase in weight before the last portions of the moisture have disappeared.

A material such as wood pulp, if subjected to prolonged heating after it has reached a constant weight at a temperature approaching the boiling point of water and while the atmospheric pressure is normal, will also increase in weight by oxidation. At higher temperatures, which approximate 150 deg. C., a decrease in weight would take place as a result of destructive distillation, but this is made evident by the charred appearance of the material, and the former error is the one that is most likely to occur.

The overweight resulting from oxidation can be prevented by removing the material from the oven when constant weight is reached, or by drying in vacuo.

Pulp materials having a hygroscopic nature may be so influenced by atmospheric conditions and the aqueous movement resulting from capillary action that the moisture balance becomes entirely altered. In such a case the problem of determining the amount of moisture in the whole mass, by selecting an average or representative sample, becomes a very difficult one. It is not surprising, therefore, that in endeavoring to determine the dry weight of a material such as ground wood or cellulose, different operators, under different conditions, and at different times, obtain variable results.

In commerce many differences arise regarding the actual amount of pulp in a given shipment, and these will certainly occur as long as the parties who disagree insist upon arriving at their results in a different manner. When an independent authority is called upon to decide the question, the material in controversy is generally in a very unsuitable condition for accurate sampling, and a definite adjustment is difficult to obtain.

Of course, in buying pulp the dealers or consumers naturally desire to be convinced that the invoice rendered accurately represents the shipment that they receive. They are quite reluctant to accepting as final the tests made by the producer at the mill, which fix the amount of net weight for which they are asked to pay. The fact that the consumer has no definite knowledge concerning the means by which these results are obtained fully justifies his demand for a test by a disinterested party to verify or correct the shipper's statement of the amount sold.

The manufacturer of the pulp, on the other hand, has not the slightest objection to an independent test, but he feels that he has an equal right with the purchaser in knowing how these tests are to be made. It is also a great hard-

ship upon him, in case his pulp should be refused at the receiving end as a result of a disagreement regarding the amount of the shipment. The shipper believes that he has been able to sample and test his material under more favorable conditions than the representative of the buyer, and that in consequence his results should be more reliable. His claim that he has dried a larger number of samples, and that at the time of his testing the moisture content was more evenly distributed, is an argument that cannot be ignored.

It is evident that some system which will be fair to both buyer and seller, and one that will operate with a minimum of friction, must eventually be evolved, and the present tendencies point to a solution somewhat along the following lines, as suggested to us by J. A. DeCew, chemical engineer, Montreal :—

By arranging to have a suitable inspector at the mill, who would test and report upon the product at the time of shipment, any differences that might arise could be satisfactorily adjusted before any heavy expenses had been incurred. This inspector should be a disinterested and competent man, who would be required to test the material under those conditions that give the most accurate results. The shipment would be stamped with the inspector's mark, and a complete report of weights and tests would be delivered to each contracting party, who would divide equally the cost of the work. Full information regarding the methods employed in obtaining the results would be also given when desired. By such a method it is probable that a much higher degree of accuracy would be reached in determining the actual quantity of pulp than is now obtained, and the cost of the work should not exceed the amount now spent by the buyer and seller upon their determinations. Such a system as above mentioned would not be difficult to establish, providing the Wood Pulp Associations representing both manufacturers and users could agree upon suitable inspectors for the work.

PAPER FOR SPECIAL PURPOSES.

A book has just been published by Scott, Greenwood & Son, London (and Copp, Clark Co., Limited, Toronto), entitled "The Treatment of Paper for Special Purposes," written by Louis Edgar Andes, and translated from the German by Chas. Salter. It should be of considerable value to everyone interested in any of the branches of the paper-making trade, being a practical introduction to the preparation of paper products for all purposes. These include parchment paper, transfer papers, preservative papers, grained transfer papers, fireproof and anti-falsification papers, polishing papers, tracing and copying, chalk and litho transfer papers, leather papers, luminous, tortoiseshell, ivory, metal, and colored papers, etc., and paper articles. Instructions for working up paper into a great variety of products may be found in many books and periodicals, it is true, but the task undertaken by the author is to sift and collect them and place them in a presentable shape.

—Letters and telegrams from Canadian paper manufacturers, including J. R. Booth and Carl Riordon. which were read at Washington in connection with the enquiry into the alleged paper combine, showed that certain lines of labor in paper mills were more highly paid in Canada than in the United States.

PULP AND PAPER NEWS

A. J. Moore & Son, Bulwer, Que., have registered a partnership as pulpwood manufacturers.

* * *

The "Gazette" office at Glace Bay, N.S., was destroyed by fire at a loss of $15,000; insurance, $8,000.

* * *

Several parties are looking around in the Cobalt district for pulp limits. A large quantity of wood has been coming down the railroad.

* * *

The Upper Ottawa Improvement Co., Ottawa, is getting its steamer, scows and men in readiness for the season's work of bringing down pulp logs.

* * * *

Merrick, Anderson & Co., Elmwood, Man., have started construction work on their tar paper plant. It will cost about $28,000, and is to be completed by June 5th.

* * *

We regret to learn of the death of Herbert Lawrence Price, eldest son of Herbert M. Price, of Quebec, which took place as a consequence of injuries received by falling down a shaft 160 feet deep in the Victoria Mines, Sudbury, Ont.

* * * *

A boom of logs belonging to the James MacLaren Co., Buckingham, Que., on the Lievre River, broke a few days ago, owing to spring freshets and to the disastrous landslide up stream. The Company, however, has enough pulp logs in reserve to continue running its pulp mill, though it was temporarily thrown idle owing to the muddy state of the river.

* * * *

The Quebec Government has cancelled fifty-one lots in Boyer township, the Nominingue Colonization Reserve, for the non-fulfilment by the settlers of the settlement conditions. This drastic measure is in compliance with representations made by an important deputation of timber limit holders which waited on Premier Gouin and pointed out that a large number of lots in Boyer were being held, not by bona-fide settlers, but by A. C. Miquilon, of Danville, for timber speculation purposes. The previous lots cancelled brings the total in Boyer up to eighty-eight, which should do much to stamp out timber speculation and fake settlement in the Province.

A PULP NOVEL.

"King Spruce," by Holman Day, is the title of a modern-day romance, having the pulp-wood forests as a setting. It is the story of a strong man's fight for love in the great woods of Maine, and almost necessarily, since it is a story which is true to elemental life, it stirs the blood. The hero, a college man, an excellent type, pits himself against the timber barons, personified in King Spruce, the woodsmen's name for the beautiful and valuable spruce trees, rulers of forests and waterways, and even the lives of men. He is in love with the daughter of the chief of the barons, and throws himself into the desperate life of the woods, which is depicted by an author who knows the woods and the motives which govern the men who are at home in them. Through fire and floods, through the perils of drifting snows and icy sluiceways, rushing and grinding logs and reckless men, the story almost rushes through its dramatic course. It will certainly keep the attention of the reader at its most tense pitch until the book is laid aside—finished, or to be re-read. It is published by Harper & Bros., New York. Price, $1.50.

The Brompton Pulp and Paper Co.'s mill at East Angus, P.Q., has now reopened after being closed down a month for improvements and repairs.

NEWS OF THE MILLS

The Riordon Paper Mills at Merritton, Ont., closed down again towards the end of last month for repairs.

* * *

Jas. Beveridge has secured a site for his proposed pulp and paper mill at Millerton, N.B., and is proceeding to let contracts for buildings and for the necessary machinery.

* * *

The Harmsworths are about to build a paper mill at Gravesend, near London, Eng., which will utilize pulp made at their Newfoundland mills.

* * *

W. J. Findlay, of W. J. Findlay & Co.'s paper mill, Strathcona, Ont., was in Toronto last week. He reports a fair number of orders in hand. The mill makes manila, wrappings, etc.

* * *

The affairs of the Cornwall Paper Manufacturing Co., Limited, Mille Roches, Ont., will be wound up, and the Trust and Guarantee Co. appointed liquidator. It makes chiefly book, writing and envelope papers.

* * *

The Bay Shore Lumber Co., Salmon River, N.B., may possibly erect pulp and paper mills in St. Martin's or its vicinity, particularly if the Dominion Government should prohibit the exportation of pulp-wood.

* * *

The Patterson Eckert Lumber Co., Limited, Chilliwack, B.C., has, by its charter granted by the British Columbia Government, authority to build pulp and paper mills. Eugene Patterson and H. Eckert, Chilliwack, B. C., are the chief owners.

* * *

F. T Ranney, of Detroit, and Ralph Loveland, of Saginaw, Mich., have secured control of 150 square miles of spruce timber land near Thessalon, Ont. and state they will certainly put up a pulp mill if the United States Government removes the duty.

The pulp mill of the North Shore Railway and Navigation Co., Clarke City, Que., is being equipped with eighteen wet machines and four Success screens by the Friction Pulley and Machine Works, Sandy Hill, N.Y., in conjunction with the Waterous Engine Works Co., Limited, Brantford, Ont.

* * *

At the Miramichi Lumber Co.'s rossing mill at Morrison Cove, N.B., a few days ago, between fifty and sixty markers went out on strike, claiming $1.65 per day, the wage they received last year, instead of $1.50, which is the rate now being given. The strikers' places, however, were filled by other men and the mill is now running full blast.

* * *

Attention is called by people living around Grand Forks, B.C., to the excellent prospects existing there for the establishment of pulp and paper mills. There are vast quantities of spruce and balm of gilead in the district, through which runs a river, as well as the Kettle River Railroad. The West Kootenay Power Co. has installed electric power.

* * *

In connection with the recent visit of Mr. Millington to Fraserville, Que., it is rumored that the River du Loup Pulp Co., of that town, contemplate putting in a paper-making plant. The River du Loup Pulp Co. manufactures ground wood pulp, having six grinders with a capacity of 40 tons, dry, per day. The president is Jas. J. Warren, and the secretary, E. C. Myers, of the Trust and Guarantee Co., 45 King Street West, Toronto. The superintendent of the mill is K. L. Warren. The superintendent is not a relative of the president.

* * * *

Kilgour Bros., Toronto, are negotiating for the purchase of a controlling interest in the Canada Paper Co. It is understood that the idea is to take over a large proportion of the common stock

and to convert it into bonds and preferred. As at present organized the company has $600,000 common, $400,000 of 7 per cent. preferred, and $200,000 of 5 per cent. bonds. The chief offices are in Montreal, with a branch at Toronto, while the mills are at Windsor Mills, P.Q. The directors are Sir Hugh Montagu Allan, N. S. Holt, H. M. Molson, C. R. Hosmer, Hon. R. Mackay, H. A. Allan, and Bryce J. Allan.

* * *

A despatch from Seattle, Wash., of 8th ult., stated that suit has been begun in the Superior Court by James M. Hackett and E. B. Shields against John B. Hart, Allen E. Williams, Thos. Morgan and the Bella Coola Development Co., in which the appointment of a receiver is asked, and an accounting of the funds of the defendant company by President John B. Hart and Secretary Allen E. Williams. Plaintiffs set forth in their complaint that the defendant company has a twenty-one year lease on 80,000 acres of timber land in British Columbia, subject to the agreement on the part of the company to build a pulp mill and operate it within a specified time. It is alleged that the stockholders of the company quarrelled, and John B. Hart and Allen E. Williams reorganized the concern, making a contract with the plaintiffs, who were to finance the deal, for the turning over of a certain amount of stock. It is claimed that the plaintiffs, in pursuance of the agreement, paid $21,000 in cash to Hart, but have been unable to secure the transfer of any stock. Hart is alleged to have represented to plaintiffs that the capital stock was $1,000,000, and fully paid up. Later, he is said to have represented that the company owed him personally $70,000.

—An announcement is expected shortly from the Dominion Government as to the commission which will probably be appointed to deal with the pulp-wood question.

CANADIAN WOOD PULP ASSOCIATION.

A meeting of wood pulp manufacturers was held at the Windsor Hotel on April 30th, with the view of forming themselves into an Association, the following persons being present: R. N. Kenny, assistant manager of the McLaren Pulp Co., Buckingham; J. F. Ackerman, president Ouiatchouan Pulp Co.; A. F. Millington, manager Spanish River Pulp Co.; J. E. A. Dubuc, managing director of Chicoutimi Pulp Co.; James Davy, of the Thorold Pulp Co., Thorold; G. N. McFarland, agent of Imperial Paper Mills, Sturgeon Falls; O. A. Porritt, of Price-Porritt Pulp Co., Rimouski; J. G. Sutherland, agent of Sault Ste. Marie Pulp Co. Those present at the meeting represented a daily output of 600 tons dry pulp.

J. E. A. Dubuc was called to the chair, and J. G. Sutherland acted as secretary of the meeting.

The chairman explained the object of the meeting, which was to form an Association of wood pulp manufacturers, somewhat like the Scandinavian Pulp Association.

Major Ackerman explained the scope and "modus operandi" of the Scandinavian Association regarding tariffs, freight rates, commercial intelligence, daily production, stock on hand, reports of sales (quantity, prices, and to whom sold), state of markets (Canadian, American, European). Briefly stated, the Association acts as a Bureau of Intelligence, national as well as international, for all that is of interest to the pulp manufacturers.

It was then resolved that the persons present constitute the "Canadian Wood Pulp Association." Mr. Dubuc was elected president; Messrs. Macintosh & Hyde, chartered accountants, Montreal, were elected secretaries.

It being agreed that a uniform contract of sale of pulp should be adopted by all members of the Association, Mr. Millington was requested to draft a contract form, which will be taken into consideration at the next meeting.

COMBINED MECHANICAL AND CHEMICAL PULP.

Mechanical pulp is apt to contain coarse masses of fibre still containing the natural vegetable and mineral substances associated with the cellulose in the plant. The presence of these knots is a great hindrance to the felting of the fibres essential for the production of paper. Now, chemical pulp is free from this drawback, but costs more to produce.

"Papier Fabricant" describes a plan to combine the two processes, so as to prevent the occurrence of knots while making the pulp, which, if a little dearer than the mechanical product, yet is considerably cheaper than pulp made by chemical processes only.

The woody fibre is first treated with waste lyes from chemical pulp manufacture, or even with boiling water, and then ground mechanically. If this process is adopted the preliminary cooking requires both a lower temperature and a lower pressure than are required when the process is a merely chemical one. It cannot, however, be admitted that the product is never so good for the better class of papers as chemical pulp. The weak lyes used are incapable of disintegrating the pulp sufficiently for the manufacture of the better kind of papers, no matter how far the after grinding is carried consistently with a real saving in expense.

It has been suggested that when considerations of expense do not forbid, and they will not unless in exceptional cases, it would be better to grind the wood first, treating with weak lyes afterward. Such a process naturally has the effect that the weak lyes act better upon the already partially ground fibre. If, however, for any reason weak lyes are especially cheap and the grinding process more expensive than usual, the combination process may be better.

—As we go to press we learn of a serious fire at the Lake Superior Consolidated Co.'s works at Sault Ste. Marie, Ont., whereby the paper mill and power plant were put out of operation and the pulp and paper storeroom destroyed. Two men lost their lives. Estimated loss about $300,000. All departments will be rebuilt at once. We understand that the pulp mill machinery was not damaged.

—J. A. DeCew, chemical engineer, has removed his offices to the Canadian Express Co's new building. McGill Street, Montreal, where he will provide himself with improved laboratory appliances. Mr DeCew is now reaping the reward of his faith in the future of the pulp and paper trades, having recently received some important commissions for analyzing and testing papers and pulps.

—A five-ton, three-motor electric steel derrick of 75 feet radius and 60 feet lift has just been installed at the plant of the St. Louis Basket and Box Co., St. Louis, Mo. The derrick was manufactured and installed by the Northern Engineering Works, Detroit, Mich. It is of the high-speed type, hoisting at a speed of 60 to 125 feet per minute, and having all its motions operated by electric motor. The derrick is located on the river bank, handling material from the river to the yard of the box manufactory, and is supported by heavy, stiff legs, the frame and stiff legs being entirely of latticed steel construction.

—The Improved Paper Machinery Co., Nashua, N.H., sends us a copy of a beautiful new catalogue describing their Pneumatic Save-All, which has been designed, built and installed in many leading pulp and paper mills to meet the need for machinery which shall both be economical in working and improving to the quality of the product. The Pneumatic Save-All is, briefly, a machine for saving the stock which ordinarily is carried off in the white water, a task which it accomplishes through pneumatic pressure and vacuum. The catalogue referred to describes the machine in detail, and is amply illustrated by half-tone cuts.

A TOWER SYSTEM OF DRYING.

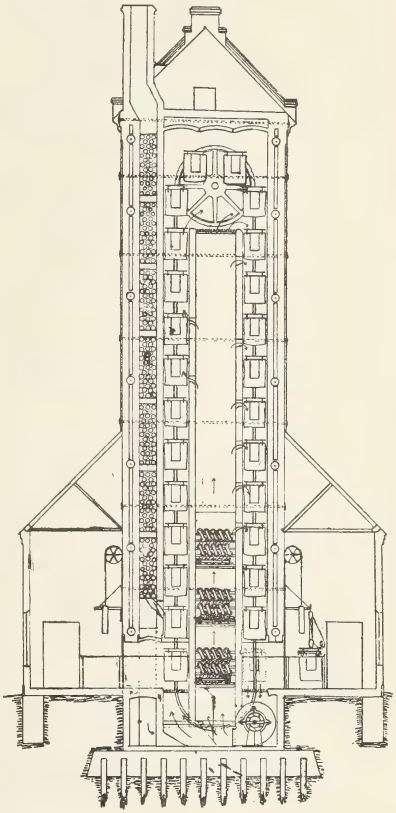
In the drying of any substance there are always two considerations of great importance namely, quality and cost. The cost must be as low as possible, the drying uniform, and this must also be as rapid as is possible without impairing the quality of the material.

There are many systems of drying that are more or less successful on special materials, and it is the object of this paper to describe a method that has become pretty generally adopted by the pulp and paper mills in the Scandinavian countries. The system has a number of original features, which are a development from such experimental work in early installations, and the perfected plant as it is built to-day is claimed by the users to give excellent results.

It was learned from very early experience that pulp, boards, etc., should never be exposed to an absolutely dry, warm air, because the fibres on the surface become too dry, and could not absorb and transmit the moisture from the interior. Boards will under such circumstances buckle and warp, and thus coming in contact with each other will dry unevenly. If toward the completion of the drying boards are exposed to hot, dry air they will change color and become hard and brittle, and will have to recover sufficient moisture before they can be glazed or otherwise worked. Dried in this way bleached pulp will lose its white color, and ground wood will lose its hygroscopic character, and is never as good for paper-making.

The same differences result from drying these materials upon steam rolls, in which case the strength and quality of the pulp are injured, and the cost is high.

The system we are now describing, however, uses as a drying agent a moderately moist, warm air, which always has a capacity for absorbing more moisture from the pulp that it surrounds. We might consider it similar to a mixture of superheated steam and atmospheric air, and this is kept in constant circulation through the drying towers by means of a fan, as shown in the accompanying illustration. As the capacity for absorption is not so great as in quite dry air, the rate of drying cannot be unduly forced to the detriment of the material. In fact, the drying is so regulated that the pores remain open, enabling the moisture to evaporate freely from the interior of the material. The saturated current of air is exhausted from the tower at a high temperature, and in order to utilize this heat the exhaust is passed through an economizer on its way to the outer air. The economizer (R) is an arrangement of tubes upon which the saturated air condenses its vapor, while the air enters through the tubes, and is well warmed before it comes into the circulation of the tower. In this way



a large amount of waste heat is recovered, and a considerable saving effected in the fuel required. The warm condensed water is also used again in the boilers that supply the heaters.

Referring to the illustration, the treatment in the towers is as follows: The pulp or board hangs in isolated sheets that are fastened by special clips to the car. This cage is automatically caught and hoisted between two endless link belts. The wet pulp enters beneath the economizer shown on the left side of the illustration, and being caught by the chains is carried slowly upward. At first it meets the hot, saturated air that passes from the fan into the economizer as it is leaving the tower. A little farther up in the tower it comes in contact with the warm air which has just entered through the economizer, and which is drawn rapidly upward by the suction of the fan. When the pulp reaches the top of the tower it comes in further contact with the air which rises from the heaters in the centre of the tower, and which, with its increased capacity for absorbing moisture is rapidly drawn in the direction of the fan.

As the pulp descends on the dry side the air circulation is accelerated and the temperature increased, so that the drying is finished at somewhere near 200 degs. Fahr. When the material reaches the bottom of the tower, opposite to where it entered, it rings an electric bell, the attendant opens the door and the car containing the air dry pulp is automatically ejected. The material will contain about 10 per cent. moisture, and this will be evenly distributed through the sheets. These have been reduced from 50 per cent. or 60 per cent. moisture in from four to six hours by passing once through the tower. The cage that carries the material is built with self-contained wheels, or an arrangement by which it can be carried on a trolley, and the attendant is thus enabled to move it easily in and out of the tower. The chain wheels are driven by gearing from a countershaft, which is provided with a cone pulley to allow for variations in speed.

It has been found that one man and a boy can easily attend to a tower capable of turning out eight to nine tons of dry material per day. Owing to the fact that the weight of the contents of the dryer is nearly balanced, and that the rate of motion is slow, the power required to move it is only one to two horse-power. The power required for the fan will be from five to ten horse-power, according to the capacity of the tower. One particular feature of this system is the small amount of floor space required; for instance, a tower of a capacity of eight to nine tons of dry material per day will occupy only about 300 square feet, being about one-fifteenth the usual requirement.

As these tower dryers are not built of wood, the insurance companies seem to find them a very good risk, because the Norwegian and Swedish makers, after installation, have been able to obtain the same rates as they would have to pay without any dryers at all.

The pulp and cellulose dried in these towers is found to be whiter and tougher than that dried in other ways, and is also more uniformly dried. The fact being established that the results are found very satisfactory, the remaining points to consider are the initial investment required and the cost of drying. Taking into consideration the drying capacity of the towers, and the stability of their construction, the first cost of the plant is a very moderate one, but this will depend very largely upon local conditions, such as labor and cost of materials.

The fact that to the most of us either recommends or condemns a system is the cost of drying or the fuel required, and, other things being nearly equal, this is the factor of paramount importance. I am unable at present to give any results of tests made with the latest type of these dryers, but the following report of a trial made on a tower of the older design erected in Sweden will

show what was done over ten years ago with this drying system.

The trial lasted from 7 p.m. until 3.45 a.m. on the night between 13th and 14th February, 1896, there being a heavy fall of snow at the time.

Temperature of outside air	5 C. =	23 Fahr.
Temperature of air entering through economizer	10 C. =	50 Fahr.
Temperature of air from heater	100 C. =	212 Fahr.
Temperature of exhaust from chimney	28 C. =	82 Fahr.

Saturation of Air.—At 50° Fahr. 1,000 cubic feet of saturated air contains about .6 pound of vapor, and at 82° Fahr. about 1.67 pounds. Each 1,000 cubic feet has, therefore, absorbed about 1 pound of moisture.

Capacity.—During the trial 40 cages were taken out of the tower containing 2,520 sheets dry pulp, which weighed—

When wet	10,000 pounds
When dry	4,700 "
Moisture evaporated ..	5,300 pounds

= 53 per cent. the weight of pulp.

Fuel.—Only pine wood was obtaintainable, of which 106 cubic feet, or 2,170 pounds, were burned. This is equivalent to 48 cubic feet, or 1,000 pounds fuel per ton of dry pulp. The calorific value of this pine as compared to ordinary steam coal is about 1 :2.5; therefore, the wood used is equivalent to 400 pounds of coal per ton of dry pulp. In this older design the heater was not inside the tower, so the present installations must be doing better than this.

As it is considered very good practice to dry one ton of pulp with 1,000 pounds of coal when using drying cylinders, a relative comparison of the cost of the two methods can be readily made.

In the face of these facts it is not surprising that in less than ten years' time this system has become almost universally adopted by the European pulp and board makers, for at present there are over twenty-six of these drying towers in operation, and they are producing over 40,000 tons of dry material per year.—J. A. DeCew, in Paper Trade Journal.

CONFERENCE ON NATURAL RESOURCES.

President Roosevelt invited the Governors of States and Territories, as well as many other prominent men, to a conference this month on the Conservation of Natural Resources, in view of the urgent need which exists for taking stock thereof. Among those invited was David S. Cowles, president of the American Paper and Pulp Association, and in his acceptance of the invitation he replied as follows:—

There are two questions of intense and vital interest to the paper-making industry. First, the preservation of our forests. Second, the development of water powers. I believe it to be a safe statement that where the paper-making interest is the owner of spruce timber lands, the most approved forestry methods which are practical at this time in this country are observed in cutting timber for paper-making purposes. I venture to say that in such cases, instead of destroying the forest, the paper industry is preserving it and making it reproducing.

—Howard Parker, of Nashua, N.H., and J. H. Perkins, of Mansonville, are negotiating with Sherbrooke, P.Q., city council for the establishment of a factory there for the manufacture of paper machinery.

—The Rolland Paper Co., Montreal, send us samples of new high-grade ledger, bond and linen papers made at their new mill at St. Jerome, Que. They are very strong, are possessed of admirable erasing qualities, and are satisfactory in every way.

PROCESS FOR MAKING PAPER FROM PEAT.

Charles E. Nelson, Capac, Mich., has invented a new process of forming paper or board and the like from half-stuff containing peat fibres and the natural gelatinous matter of the peat (United States patent No. 879,888), in which the half-stuff containing peat fibres and the gelatinous matter of the peat may be produced in any desired manner. It is designed to utilize not only the peat fibres, but also a considerable amount of the natural gelatinous matter of peat, and in the finished product of the process the peat fibres give strength and body to the product, while comparatively large quantities of the gelatinous matter are present, adhering to the fibres and binding them together. In carrying out the process of the present invention, the half-stuff containing peat fibres and gelatinous matter is supplied with a sufficient quantity of water or other liquid to float it, and is carried to the stuff chest. From the stuff chest the floated matter is conducted through the necessary screens to the machine cylinder tanks, where the operation of converting it into paper or board and the like is started. Prior to the actual operation of making the half-stuff into paper board and the like the fibres and gelatinous matter are subjected to the action of heat of such temperature that the gelatinous matter is softened sufficiently to destroy any lumps which it may contain. This softening of the gelatinous matter by the action of heat brings it into a fluidic or soluble condition and causes it to be evenly and uniformly distributed among the peat fibres. Furthermore, by distributing the gelatinous matter uniformly among the peat fibres it will be obvious that the gelatinous matter will also be uniformly distributed throughout the paper board and the like when manufactured, and will thus serve to render the finished product uniformly water repellent and strong. The heating of the half-stuff prior to the operation of making it into paper board and the like preferably is effected in the machine cylinder tanks, although if desired the heating may take place in the stuff chest.

In subjecting the gelatinous matter to the action of heat of such temperature the said matter will be softened sufficiently to destroy any lumps which it may contain, it must be borne in mind that the temperature must not be sufficient to cause coagulation of said gelatinous matter, which is albuminous in its nature. After the floated half-stuff has been sufficiently heated to reduce any lumps in the gelatinous matter and to distribute the same evenly among the peat fibres, both the fibres and a comparatively large amount of the gelatinous matter are run into paper or board and the like.

The finished product of the process contains peat fibres, together with a quantity of the gelatinous matter of peat, which latter acts as a binder for the fibres. If desired the half-stuff containing peat fibres and the natural gelatinous matter of the peat may have mixed therewith a small percentage of sulphite or other hard stock. The board produced according to the present process possesses the desirable qualities of strength and durability, and in addition is moth and vermin proof; furthermore, it is damp repellent even if unsized, and is also a non-conductor of electricity and an excellent insulating material.

The herein described method of producing paper or board and the like from half-stuff containing peat fibres and the natural gelatinous matter of the peat by floating and heating the fibres and gelatinous matter of the peat and then running both the fibres and gelatinous matter into paper board and the like may be varied widely, providing the consideration of maintaining a comparatively large quantity of gelatinous matter in connection with the peat fibres be kept in view.

PAPER LOADING WITH GYPSUM AND PLASTER OF PARIS.

Gypsum is extensively employed as a filling for paper pulp, both on account of its perfect whiteness and its low price, in spite of the fact that it is incapable of forming any but a very thin paste with water, and having but a slight amount of adhesive power. Hence it is impossible to load paper very heavily with gypsum alone. Plaster of Paris, which is burnt gypsum, has been proposed as a weighting material for paper, but is open to the obvious inconvenience of setting after mixture with water. This property, which makes plaster of Paris so valuable for many well-known purposes, puts it out of court as a substance for giving weight and fulness to paper. If any considerable quantity of plaster of Paris were incorporated with a paper, the result would be a stiff and brittle mass that would be unrecognizable as paper, to say nothing of the fact that plaster of Paris is dearer than gypsum (being made from it), and, except as regards its finest qualities, has not the pure white colour of the unburnt mineral. The writer has discovered, however, that the drawbacks of both gypsum and plaster of Paris, the impossibility of securing a heavy load on the one hand and the formation of a hard and brittle mass on the other, can be avoided by using a mixture of the two bodies in suitable proportions. Such a mixture does not set hard after mixing with water, but differs from gypsum alone in giving an extremely thick, smooth paste, with which paper can be loaded up to a very high point. It goes without saying that only the best plaster of Paris can be used to make this mixture as perfect whiteness of the filling is a prime requisite. Nevertheless, the mixture is cheaper than the best plaster of Paris, to say nothing of its superiority to that product as a filling agent for paper. Fillings composed of these mixtures of gypsum and plaster of Paris are cheaper than talc or China clay, and will give as heavy a loading as these or any other mineral filling.

As regards the proportions which should exist between the hydrated and the anhydrous sulphate of lime, it may be stated roughly that the latter should constitute about 25 per cent. of the mixture, the former therefore about 75 per cent. These proportions, however, apply only to mixtures in which the smaller ingredient has been completely burnt. When incompletely dehydrated sulphate of lime is used, the percentage of it in the loading mixture must exceed 25 per cent., and may have to be 30 or even 32 per cent.—Revue de la Papeterie.

DURABLE BOOK PAPER.

The most durable book paper consists of the very best grade of pure cellulose (vegetable fibre), beaten or cut to pieces of the proper length (about 1-30 of an inch), thoroughly felted, freed from acids and chlorides and sized with a minimum amount of rosin. The best cellulose for this purpose comes from the fibres of the cotton plant. This particular fibre is a thin walled tube which collapses in a peculiar twisted manner in the beating process, interlaces in the felting process much better than other fibres and holds its grasp tenaciously. It is strong, flexible and durable, but can be seriously injured by over-bleaching and is subject to gradual oxidation if the chemicals used in the processes of paper-making are not eliminated. Celluloses derived from flax and hemp stand next in order to those from cotton. Those derived from wood by the sulphite and soda processes come next, but are inferior in many respects. These wood celluloses may, however, be used to a limited extent with those derived from cotton flax or hemp (not less than 70 per cent. of the latter class nor more than 30 per cent. of the former) for the manufacture of the lowest grades of paper that will serve for publications of permanent value. These lower grades

may also have a slight loading of clay (total ash not exceeding 10 per cent.) but it is advisable to restrict the loading to the least amount that will give the finish and printing quality desired, for strength and flexibility are adversely affected by overloading.

Books which have a permanent usefulness are usually published in small editions and constitute but a small proportion of the total output of the printing presses. The higher grades of cellulose are derived from sources which could undoubtedly be made to yield the quantity needed for all such books. And there are manufacturers who are willing to make any kind of paper for which there is a demand.

The New England Historic Genealogical Society has demonstrated that it is possible to secure paper of the desired quality. For over thirty years that used in its magazine has been made to order by one manufacturer as desired by the Committee on Publications. Beginning with the year 1908, this paper, formerly known as the "Register paper" is to be water-marked ("N. E. H. G. S.—Standard"), so that authors and compilers who wish it to be used for their books will have no difficulty in obtaining the genuine Register paper. The formula of this paper is: Fibres from cotton rags, not less than 75 per cent.; fibres from wood (sulphite spruce and soda poplar not more than 25 per cent.; loading clay (total ash not to exceed 10 per cent.; and freedom from all but the merest trace of acids and chloride. This formula is in substantial agreement with the recommendations of the Committee on Deterioration of Paper, appointed by the Society for the Encouragement of Arts, Manufactures and Commerce, whose report (London, 1898 shows an exhaustive study of the subject; and the leading German, English and American chemists who have made a study of the manufacture of paper believe that the paper properly made on such a specification will prove sufficiently lasting for publications of permanent value.

The experienced chemist, by the aid of the microscope, can readily distinguish the various kinds of celluloses and estimate the approximate proportion of each found in a given sample of paper. He can also determine the presence of impurities, acids and chlorides; hence it is possible and practicable for an author or compiler to determine, at a small expense (the chemist's fee for analysis) whether a given lot of paper conforms to a required formula or not, by means of the analysis of a sample selected at random.

BRITISH VIEW OF CANADIAN SITUATION.

Meanwhile, America's big and vigorous neighbor, our own resourceful scion, Canada, has, through the skill, energy, and intelligence of her business men, all but entirely escaped the effects of the crisis which caused so much disaster last year to the best interests of the United States. The year 1907 was one of unexampled prosperity to the Dominion, and the record seems likely to be easily broken by 1908. The country is forging ahead amazingly in all material directions. Even the pulp and papermaking interests of the Dominion, which have evoked some criticism on this side, are promising better things, and have profited by the frank advice and admonitions which have crossed the Atlantic from the Old Country. Sir Albert Rollit struck a true note, when speaking at an Anglo-Canadian banquet in London the other night, when he said that we on this side required a more elastic system of credit in dealing with Canada, whilst Canada on her part required better insolvency laws. Some mutual adjustment in these particulars would unquestionably tend to promote Anglo-Canadian trading relations—in pulp and paper as in other things—which are capable of indefinite development.—World's Paper Trade Review.

FIRST PRINCIPLES IN THE MANUFACTURE OF KRAFT PAPER.

By J. A. DeCew, Chemical Engineer, Montreal.

Much has been said, from time to time, with reference to the large importations of Kraft paper into America, which would indicate that this particular instance of "carrying coals to Newcastle" is a result of a lack of knowledge, on the part of our pulp-makers, regarding this particular product.

In the opinion of the writer this conception is somewhat eroneous, the reason why we do not supply our own market with this product, being largely a financial one. It is generally admitted by all, that this industry should be an exceedingly profitable one if established in America, but the uncertainties that are supposed to exist in the methods employed appear to be the deterring factor to anyone contemplating the erection of a plant. There are few things, however, in industrial work that cannot be obtained if the capital for the investment is available and we may justly look upon this industry as one of Canada's great potentialities, still lying undeveloped for want of sufficient funds for the purpose. Conceding the fact that the mills engaged in the manufacture of this paper are careful to conceal the details of their work from their competitors, yet it is quite impossible to prevent the basic principles of this manufacture from becoming generally known. These first principles are always a safer base to work upon than any imitation, for it is probable that no two mills making Kraft paper use exactly the same method for obtaining this result. One may ascribe his success to his method of cooking the pulp, another to the treatment in the Kollergang, and another to the method of beating; all of which, no doubt, have their influence upon the product. But what does it matter how the working details are carried out, as long as the required result can be obtained.

In a word, the principle upon which the Kraft process depends, is the production by chemical and mechanical means, of the heaviest possible individual fibre, and working it into an extremely hydrated condition, which would be described by the paper-maker as being wet or slow.

By using insufficient alkali for complete resolution and regulating the cooking process to obtain a uniform absorption, the woody structure is broken down although not completely dissolved. By crushing in the Kollergang the fibres are finally isolated, and in this apparatus they also assume a partially hydrated condition. This process is carried on in the beating engine with as little cutting of the fibres as possible, and with this long, but hydrated, fibre a very strong sheet of paper can be made. This paper is more easily made from the fresh pulp, because it is then in a more reactive condition, than it is later when more or less oxidation of the lignified residue has taken place. On this account it is better that the paper and pulp be made in the same mill.

One American objection to the Kraft process is the apparent necessity for the use of the Kollergang, which apparatus is not in favor on this continent on account of its small capacity in proportion to the power required.

In the opinion of the writer, the Kollergang can be dispensed with by the substitution of a further chemical treatment in the beating engine, into which the pulp chips would be taken direct from the digestor.

This chemical process is the result of a considerable amount of experimental work, and the effect it produces upon the fibre is an exceedingly rapid hydration of the cellulose, which brings it into the required condition with a minimum of power and time.

Although this treatment has not yet become commercially introduced, yet the results already obtained are sufficient to demonstrate its possibilities in this connection.

If the manufacture of Kraft paper once became established in Canada, there is little doubt but that the industry would develop very rapidly on account of the large demand for the product, and our large supplies of raw material. In addition to our spruce pulp-wood, the pine and hemlock waste from our sawmills could be used to advantage in this process, thus offering a very low cost for wood supply. It is probable, therefore, that the next few years will see a very definite advance along these lines.

PULP FOR KRAFT.

Much has lately been written, says Hans Lagert, about importing real "Kraft" paper to make the paper on this side, so as to fully match the strength and quality of the foreign article. Anybody familiar with the manufacture of this pulp knows that the raw material of the real kind as needed cannot be landed here, as it is too sensitive to stand handling; it has got to be used out of the digesters and "kollergangs" on the machines to produce the real "Kraft" sheet. How important it is to use this pulp immediately upon being cooked may be learned from the fact that manufacturers abroad would never use a cook ready on Saturday the following Monday morning alone, but mix such cook with fresh cooks ready that very morning. If the European "Kraft" makers cannot use the wet pulp only a day or two old in its natural state, how would it be possible to obtain the same results from goods having to stand the handling of being imported, which have to come dry, as the freight on wet pulp would be too expensive? This is the reason why the "Kraft" pulp makers only consider samples sent out standards for the time of six months. One or two mills in Scandinavia have, in fact, succeeded in turning out a very good grade of "Kraft" pulp of an unusual strength, even in its dry state, but as they will soon be making paper themselves, their product will soon be of little interest to the pulp trade.

It was mentioned earlier that quite a few raw materials used by the paper mills are considerably lowered in price at this writing: Old manila rope, selling in 1906 as high as 5 cents per pound (£22 15s. per ton ex dock), is now down at 2 cents per pound delivered (£9 ex. dock), and only moving lightly at that. Another article is jute, which was up in 1906 at 6 cents (£27), and in last December quoted at about $3.20 (£14 10s.), in spite of the crop only last year being 655,000 bales larger than in 1906 (9,785,000 bales against 9,130,000). Sulphur is another article having been lowered in price.

In anticipating future developments in the pulp prices in Europe, it must be remembered that the increased cost of labor, coal, etc., has raised the cost of manufacturing one ton of pulp about 17s. 6d. to 20 shillings per long ton, and as months have gone by with little or insignificant wavering in prices, the future of the pulp market tends to stability and unimportant fluctuations.

—The Beloit Iron Works Co., Beloit, Wis., has received the order for a paper machine for the Western Board and Paper Co., Kalamazoo, Mich. It will be 108 inches wide, with five cylinders and fifty dryers.

—The "Paper Maker and British Paper Trade Journal" edited by S. Chas. Phillips, and published at 47 Cannon Street, London, E.C., recently issued its special annual number, a credit to that well-known journal in every way. A special feature of this number was its Engineering Supplement, containing portraits of many prominent machinery manufacturers, etc.

NEW PROCESS OF CELLULOSE-COOKING.

A new method has been patented in Sweden for preparing wood pulp which has the great advantage that it deals with the wood in large pieces, two yards or more long, so that no chopping up is required. The logs are put into a cylindrical boiler, which rotates on a horizontal axis. The lye is then run in until the boiler is about half full. Steam is then blown in, and the cylinder is put in motion. The hot lye acts first, of course, on the outside of the logs; but as soon as that is disintegrated the tumbling of the logs one over another rubs it off, and fresh surfaces are exposed to the disintegrating action. This goes on until all the logs are completely converted into pulp. A circulation pump is then started, which drives the lye and the pulp in it through a filter-press. The lye returns to the cylinder, and the press-cakes of cellulose are taken away for rinsing.

It need hardly be mentioned that the old lye returned to the cylinder must be reinforced with fresh for a second batch of wood, and that the strength of the lye in the cylinder must be regulated according to the kind of wood under treatment. By regulating the steam-pressure, the strength of the lye and the rate of rotation any kind of wood can be dealt with in a satisfactory manner. It has been found advisable to work with a triplicate arrangement, using the waste lye from the first cylinder, with a suitable reinforcement of fresh lye for the second, and so on, so that fresh lye only is used in the first cylinder.

The avoidance of chopping or grinding greatly increases the yield of fibre, as those processes break up some of the fibre too much. Again, the use of high temperatures under pressure saves money by enabling a weaker lye to be used. It has been found that weak lyes at comparatively high temperatures tender the fibre less than strong lyes, despite the fact that the employment of such lyes permits of operating at a lower heat. A single charge may consist of both dry and wet wood, or of both hard and soft wood; but, unless under exceptional circumstances, it is most desirable to treat together logs which consist as far as possible of the same wood in the same state. It is obvious that soft wood will be more rapidly acted upon than hard wood, wet wood than dry wood. The result of these differences will be that by the time the more refractory wood has been properly pulped the less refractory fibre will have undergone necessary exposure to the lye, with the concomitant danger of injury to its strength. It is a cardinal point in pulp-making that the work should be as rapid as possible, so as to preserve the strength of the fibre, and at the same time to get a greater output in a given time.

UNEQUAL COLORING.

J. P. Korschilgen says in "Papier-fabrikant," speaking on unequal coloring of the two sides of the paper, that in cases of unequal coloring it more often happens that the top side of the sheet is the darker one than vice versa. Among the factors which influence this question of coloring, he enumerates the nature and preparation of the fibres, the sizing, the character of the coloring matter itself, the adjustments on the paper machine and the glazing.

Referring more particularly to mineral coloring matters, Mr. Korschilgen points out that the stuff on the wire acts as a filter, and that with a "free" beaten stuff, which resembles a filter with large pores, the color sinks to the bottom of the sheet, whereas with a "wet" beaten stuff, which forms a far closer web, it remains suspended. But in the latter case color is drawn out from the bottom side of the paper by the action of the suction boxes; hence the bottom becomes paler than the top. This effect can be observed by comparing a blotting paper with a hard writing paper, both colored with the

same ultramarine; the former has a darker bottom side, and the latter a darker top side.

The influence of the sizing in fixing the color is shown by the fact that unsized papers always require more color than sized papers of the same shade, and the absence of size often makes the color of the bottom side darker than that of the top.

Troubles of unequal coloring may often be prevented by using a suitable mixture of mineral colors and aniline colors. Paleness of the bottom side is sometimes caused by the accumulation of white mineral loadings on that side, the heavier minerals giving the worst results.

In sized papers the darker color of the top side as compared with the bottom side is particularly marked in the thicker sorts, including cardboards. This may be remedied by beating the stuff more "free," and ensuring the necessary strength by selecting a better quality of fibre; the sizing also should be cut down as low as is permissible, and, if possible, analine colors should be used.

With papers which hold a large proportion of water on the wire, whether owing to "wet" beating or the great thickness of the sheet, color is drawn out from the bottom side by the suction boxes, couch press and first wet press. This tendency may be regulated by putting less pressure on the first wet press and more pressure on the second press, which acts on the top side of the paper.

Unequal coloring may sometimes be cured on the glazing calenders by arranging that the last metal bowl is in contact with the paler side, and the last paper bowl with the darker side of the paper.

SULPHITE PULP BLOTTINGS.

Whilst blotting papers of very good quality made entirely of soda wood pulp have been on the market for some time, sulphite wood pulp is very rarely used for this purpose. This is because the crude sulphite pulp does not possess the properties desired in a good blotting paper and, as pointed out in an article by Dr. Van Posanner in the Wochenblatt fur Papierfabrikation, it requires a somewhat serious after treatment before these properties are developed.

In the first place the pulp must be boiled extremely clean and free from the incrusting matters of the wood. But however well boiled the pulp may be, sulphite pulp is distinguished from soda pulp by its high resin contents, which amount to 0.53 per cent., as against 0.05 for soda pulp and 0.02 for cotton. The presence of this resin has the effect of diminishing the absorbent properties of the paper to a very considerable extent, so that papers made from sulphite pulp absorb water only half as rapidly as paper made from soda pulp. But this defect, writes a correspondent to London Paper Trade Review, may be removed by suitable treatment of the pulp whereby the resin is eliminated.

A simple boiling of the pulp with water is already sufficient to improve its absorbent qualities considerably, and to lower the percentage of resinous matters. Boiling with a solution of alkali or alkali sulphide has a still more favourable effect and makes the fibres extremely soft and pliable; absorbent qualities of the paper made from pulp so treated then become equal to those of papers made from soda pulp.

As a matter of scientific interest it may be mentioned that after a treatment of the sulphite pulp with a hot solution of alkali in alcohol, blotting papers may be made which show a rise of water of 125-130 millimetres as against 45-55 with papers made from the crude pulp.

The wood pulp selected for the manufacture of blotting papers should contain only minimum proportions of ash, the presence of lime salts being particularly objectionable. The bleaching process has a very serious influence in lowering the absorbent qualities of the pulp, but the influence may be counter-

acted by subsequent boiling with water and alkali.

Besides the absorbent properties of the blotting paper, we have to bear in mind its ink-holding capacity in continued use. In this respect a cotton blotting paper leaves all the wood pulp paper, whether soda or sulphite, far behind, and can be used for a much longer time. This is a property of the structure of the fibres. For the first blotting, the structure of the fibres plays quite a subordinate part, and the absorbent properties are measured by the height to which water rises in the paper in a given time. But in the matter of the ink-holding capacity, the finer the fibres and the greater the number of small openings and channels in the surface of the paper, the longer is the life of the paper. In this respect wood pulp fibres are quite unable to compete with cotton fibres. With regard to tensile strength the papers made from sulphite pulp are very slightly inferior to those made from soda wood pulp, so that there is practically nothing to choose between them, but the wood pulp papers on the average stand distinctly in a lower category than the good cotton papers.

"OUR FOREST WEALTH."

In any estimate of our assets and revenues the forest wealth of Quebec should figure largely. The Department of Lands and Forests now give us an annual revenue of well over a million dollars, and the major part of this came from the forests. There could be no question that with a continuance of careful administration the annual receipts of our Province would very soon attain the two million dollar mark. But more than careful administration and wise laws were necessary to attain this very desirable result. It was necessary to have an awakened and intelligent public opinion on the subject of forest protection and preservation.

In some quarters it had been urged that the farming out of our public forests was a policy hostile to the colonization of our Crown lands. But those who had given most thought to this question realized that a satisfactory system of colonization was not incompatible with the preservation and working of the forestry interests of the Province. It was important that the general public should understand the truth of this statement, for undoubtedly an intelligent estimate of the claims both of colonization and forest preservation was essential to the future welfare of the Province. Every citizen of the Province took a pride in seeing our wild lands change under the industry of the genuine settler; but, perhaps, all did not consider the irreparable loss the public would suffer if any reckless destruction of our forests by speculators or others were permitted. It was very evident, in one particular, that the impairment of our forest reserves would render many of our water powers inconstant and intermittent, and thus hinder the commercial and manufacturing development of the Province.

It should ever be borne in mind that a careless forest policy would speedily result in a lessened provincial revenue, which would eventually have to be made up by taxation on the older municipalities. In this connection it was satisfactory to note that, although no sales of timber lands had been made since June, 1906, the revenues of the Department of Lands and Forests continued to bulk so largely in our annual receipts.—Province of Quebec Limit Holders' Association.

—The Valley Iron Works, Appleton, Wis., has received an order for twelve beating engines from the Oscar Felt and Paper Co., Kalamazoo, Mich. These beaters will be used for making roofing felts. This order makes ninety-one beating engines sold in the past couple of years by this firm for this one grade of product.

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or publishers "Pulp and Paper Magazine":—

338. **Wood Pulp Board.**—A firm in Barcelona, Spain, wishes to hear from Canadian exporters of wood pulp board.

346. **Agency.**—A commission agent in Birmingham wishes to take up an agency for pulp.

368. **Wood Pulp Board.**—Inquiry has been made by a Lancashire firm for the names of Canadian manufacturers and exporters of wood pulp board.

382. **Wrapping Paper.**—A Cape Town firm of wholesale general merchants desire to correspond with Canadian manufacturers of wrapping paper.

395. **Agent.**—A French exporter of woolen rags and rags for paper mills wishes to get acquainted with an agent in Canada.

428. **Stationers' Requisites.**—A London firm manufacturing stationers' requisites desires to be placed in touch with Canadian importers of such goods.

439. **Wood Flour.**—A Manchester firm of general merchants desires to open up correspondence with Canadian lumber firms with a view to importing supplies of wood flour, for which they have inquiries.

516. Wood Flour.—A London firm makes inquiry for the names of Canadian exporters of wood flour to the United Kingdom.

—A Japanese is reported, says Mr. Alex. MacLean, Canadian Trade Commissioner for Japan, to have invented and patented a new type of tile made of paper-board. He was for several years engaged in the manufacture of paste-board boxes. The idea caught him to make tiles from paste-board waste, which he daily threw away as useless. After many years' study he succeeded in finding a way of making an ideal type of roof tile which is said to be proof against rain and fire.

POSITION WANTED.

Superintendent open for Engagement.

A1 on Book, Bond, Blottings and Coating Stock 17 years experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc. Address M. R. J. care Pulp and Paper Magazine, Toronto.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

FOR SALE

One second hand revolving rag boiler, in first-class condition, driving gear and all complete, Dimensions: 6 feet diameter by 25 feet long, with 2 doors, working pressure 50 pounds per square inch. For price and further particulars apply to the Cornwall Paper Manufacturing Company, Mille Roches, Ont.

WANTED

After April 1st, (by a Swedish gentleman, at present in this country,) position as superintendent or designer of sulphite pulp or wood pulp paper mills. Large experience abroad as well as in this country. Highest testimonials for economical constructions. The advertiser is an originator in his line, especially in the chemical side of the sulphite industry. Consumption of sulphur in last sulphite mill built 8% **Brown** mech. pulp, a specialty. Address

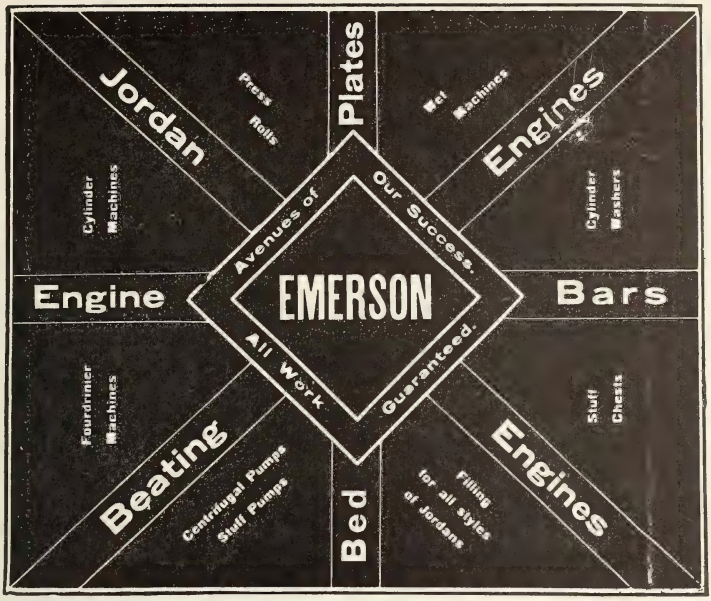
C. E. B, P. O. Box 161,
Chicoutimi, Que., Canada

Position Wanted

Englishman with family, desirous of settling in Canada, would make a change, and invites correspondence from parties needing Foreman Papermaker. Have had 8½ years as Night Superintendent and 6½ years as Day Superintendent, in one of the most successful large Pulp and Paper Mills, making best sulphite papers, mill making 31% profit and paying 20% dividend. Exceptional good references from other successful mills. Address

"DESIRABLE"
Care of PULP & PAPER MAGAZINE

EMERSON MFG. CO.



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The John McDougall Caledonian Iron Works Co.

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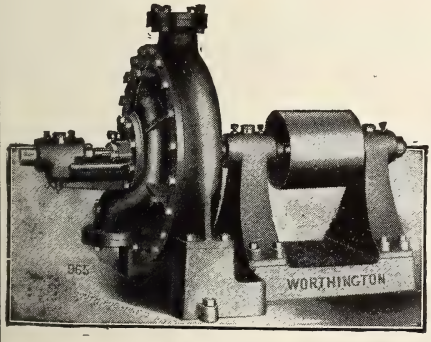

Worthington Turbine Fire Pump, working pressure 160 lbs.

BOILERS:
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For Pulp and Paper Mills.

Builders in Canada for "WORTHINGTON" TURBINE PUMPS, CONDENSERS, Etc. and New York Filter Co's. Pressure Filters.

THE MARKETS.

Toronto, May 16, 1908.

Business in most branches of the paper trade might be described as fair, although rather spotty, if it were not for the shadow cast by the depression in the United States, which appears to be just about as bad as it can be. There the consumption of book and writing papers is only about 40 to 60 per cent. of an average, and this state of things seems a long way from any real improvement. Conditions across the border naturally are effecting the demand for pulp, and there is scarcely any moving. Even those who placed orders some time ago are in no hurry for deliveries. At the same time the wood from which present stocks of pulp are being made costs so much money that holders feel very indisposed to let it go at reduced prices. So that business is practically at a standstill, and it would be almost impossible to make quotations of any value.

British Markets.—Mechanical pulp is easier, mills being pretty well supplied. The chemical pulp market is also dull, and prices are easy. Business in chemicals continues quiet, without much change in prices.

SCANDINAVIAN PULP CONTRACT NOTE.

The British Paper-makers' Association has agreed with the Scandinavian pulp makers to try for a year the method of sampling and testing pulp provided for in their proposed contract note. Some of the terms of this are as follows :—

Packing and Weight.—The pulp to be packed in bales of declared uniform weight, or a specification to be given stating the weight and number of each bale. The price is per ton of 2,240 pounds (1,015 kilos) gross for net.

Definition of "Air-dry."—By "air-dry" weight is understood ninety parts of absolutely dry pulp and ten parts water.

Quantity.—Should the buyers question the quantity of pulp invoiced, the dispute shall be forthwith determined by an agreed qualified analyst of acknowledged good standing. In the event of a dispute as to the appointment of an analyst, the buyer shall submit three names from a list of analysts approved by the British and Scandinavian Pulp and Paper Associations to the seller, one of whom must be selected. The test must take place within ten days of the claim being made.

The analyst shall, at the consumer's mill, or at any public wharf, dock, or station in the United Kingdom, forthwith sample and subsequently test the pulp, and determine the quantity to be re-invoiced. Not less than half the parcel in dispute shall be available, otherwise no claim is permissible.

The award to be final, and the costs to follow the result, but should the difference not exceed 0.5 per cent. the pulp shall not be re-invoiced, and the costs shall be borne by the buyer.

Quality.—Any dispute as to quality shall be referred to arbitration. Should the delivery of pulp be found, upon arbitration, not to be reasonably equal to the sample sold upon, it shall be left to the arbitrators or umpire to decide whether the pulp shall be rejected or taken at an adequate allowance. Fully half the parcel must be available for examination.

RATHER A MIX-UP.

The following is an extract from the Hobart (Tasmania) "Mercury" :—

The Agent-General, Hon. Alfred Dobson, writing under date of January 10th, says that nothing was done in the Australian pulp market during December, and that, as the English raspberry crop was good, a considerable quantity of Australian pulp is on hand—sufficient for several months.

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Boils off Water, not Spent Caustic.
Is easily kept clean.
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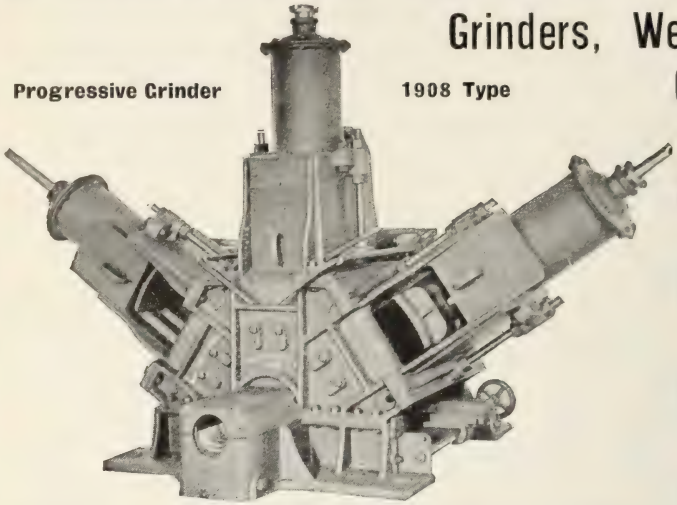

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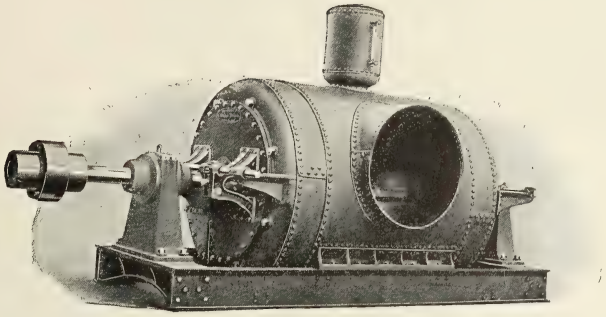

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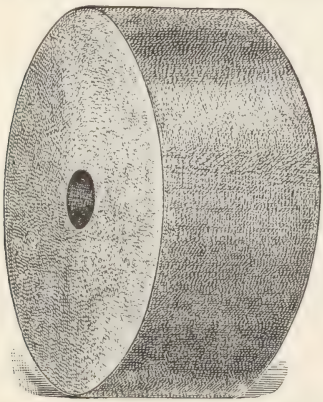

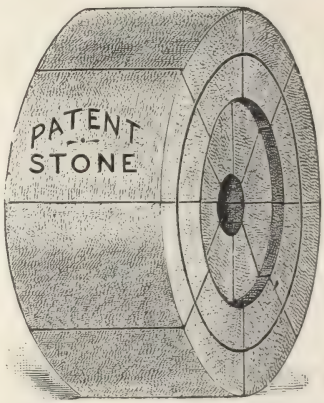

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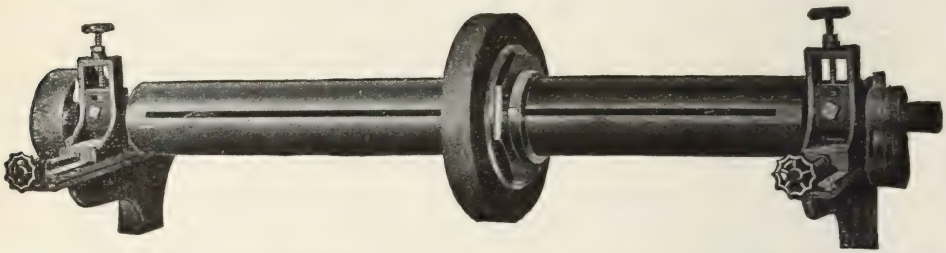

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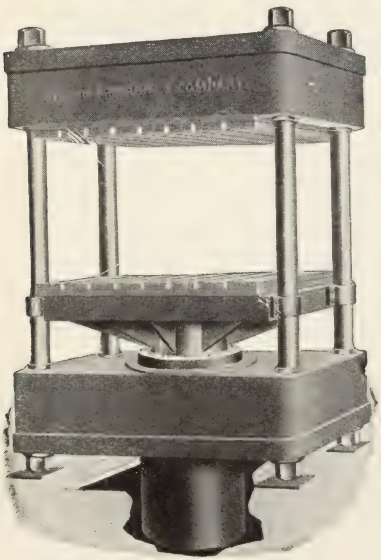

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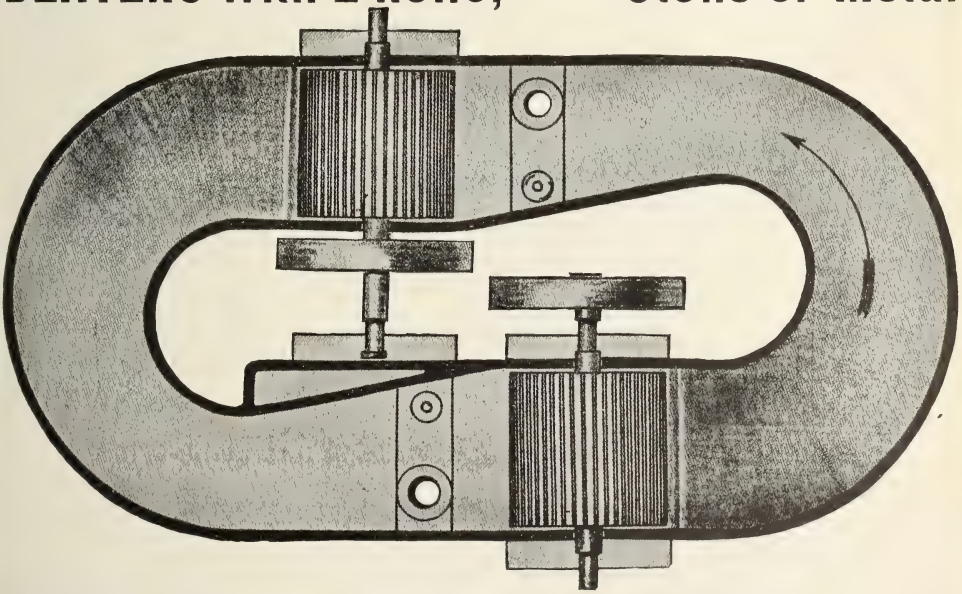

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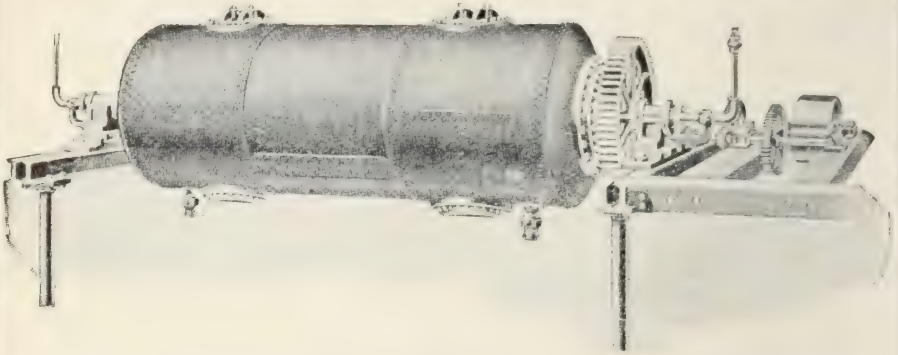

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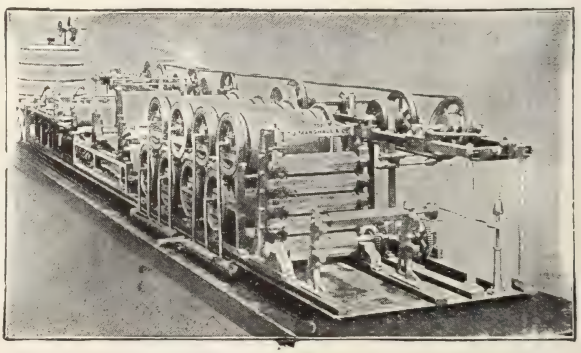

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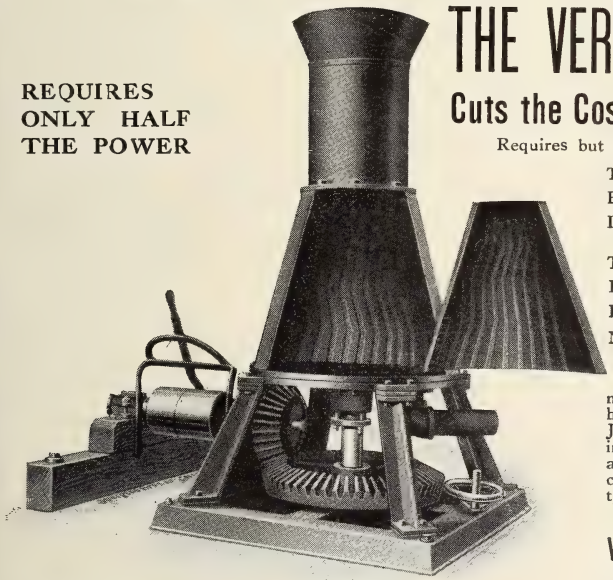

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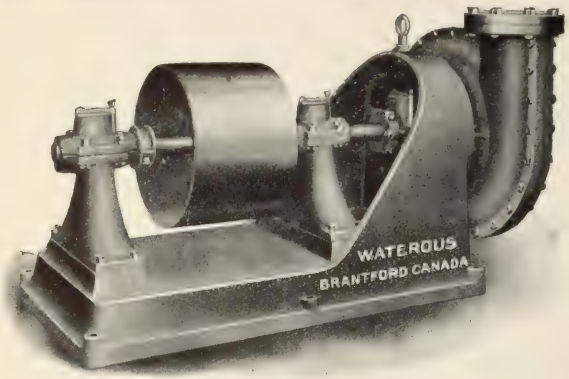

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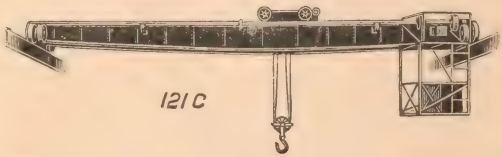

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VOL 6. TORONTO, JUNE, 1908. NO. 6

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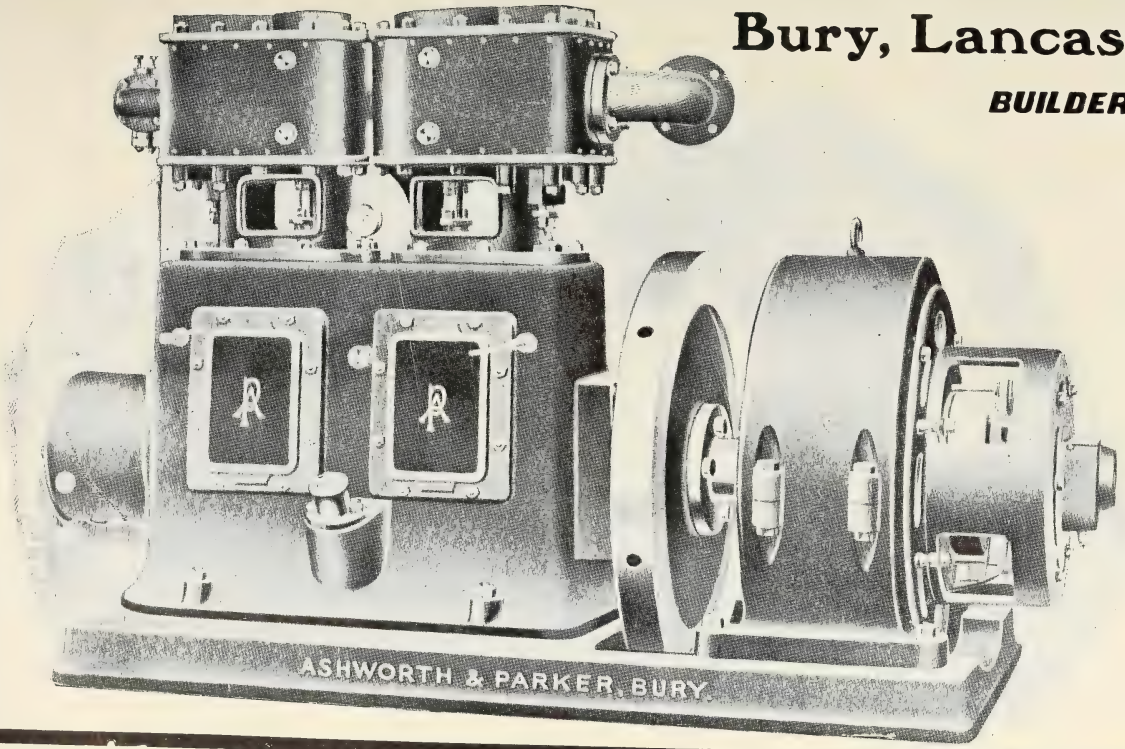

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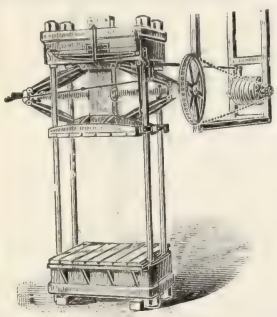

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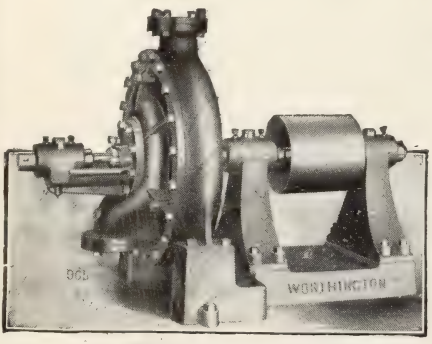

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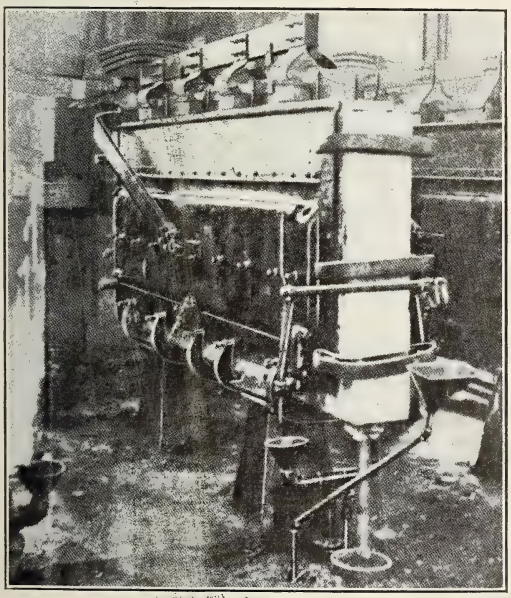

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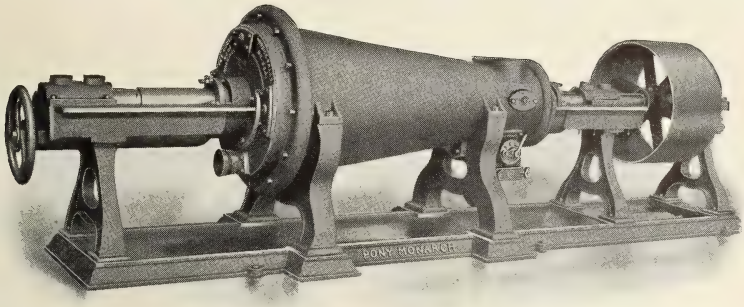

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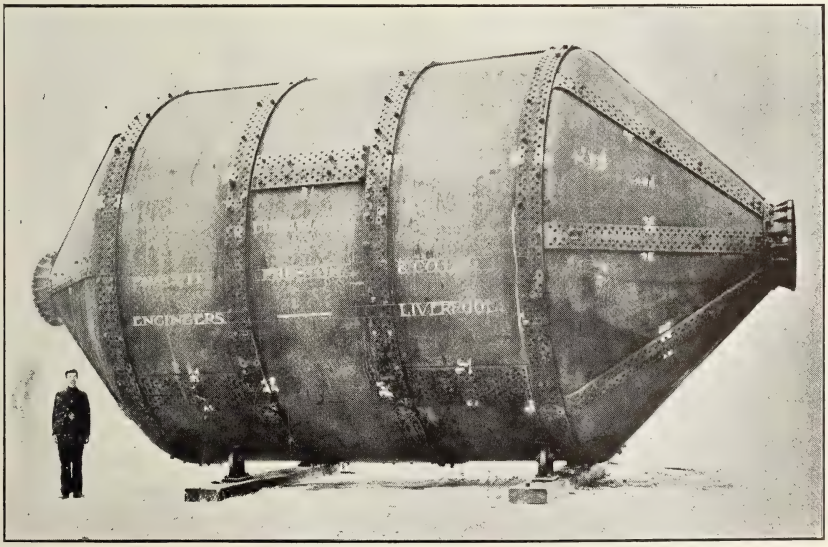

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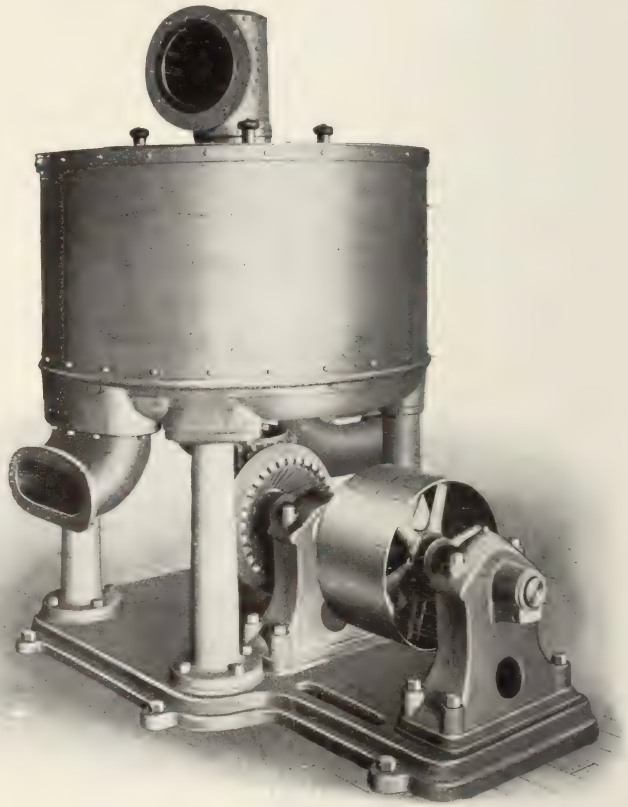

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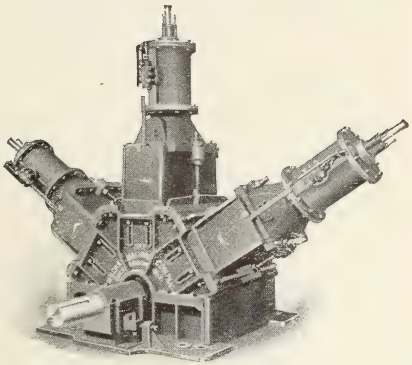

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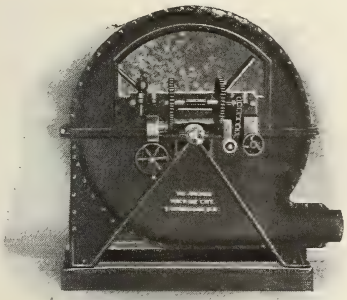

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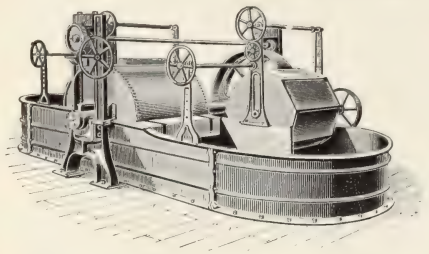

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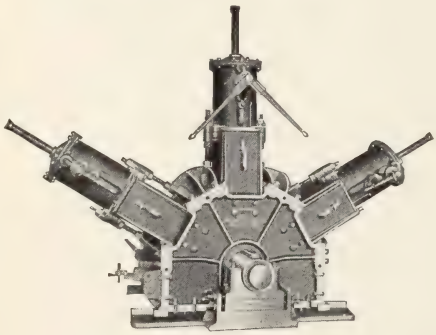

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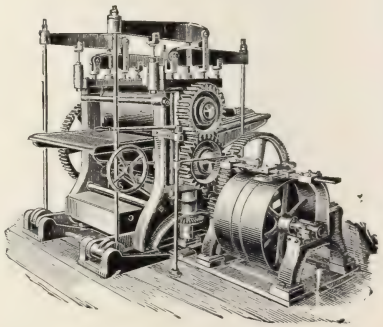

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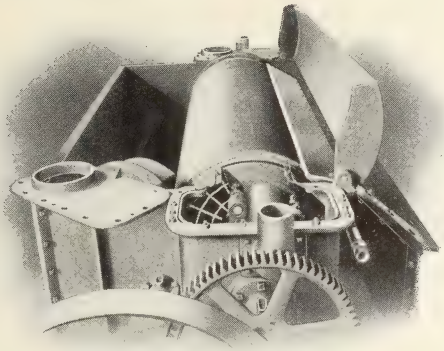

The new plant will probably be able to deliver Pneumatic Save-Alls in the early autumn. Meanwhile we are continuing to build at Ottawa, where our Save-Alls may be seen successfully operating in representative mills.

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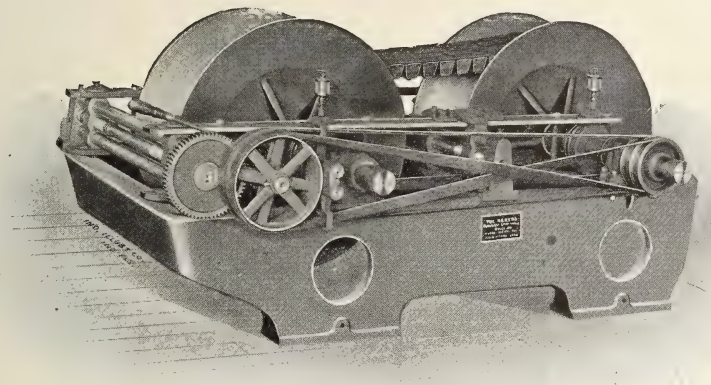

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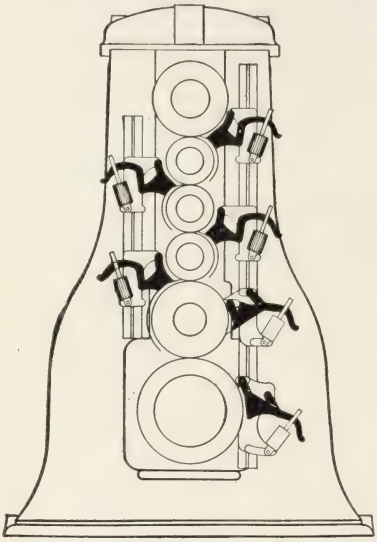

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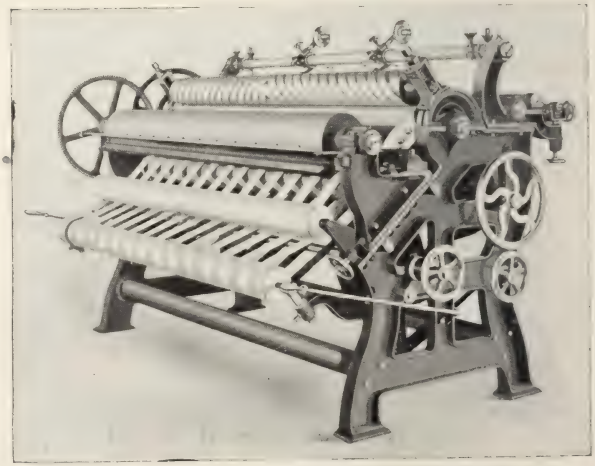

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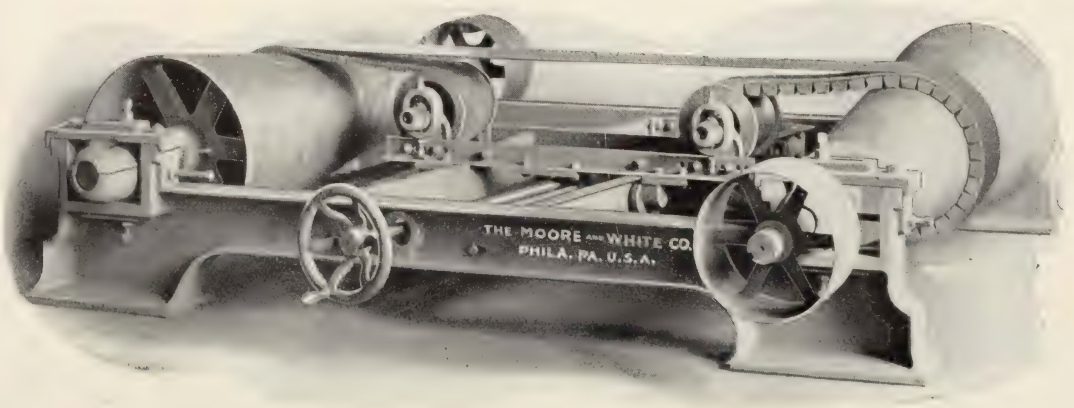

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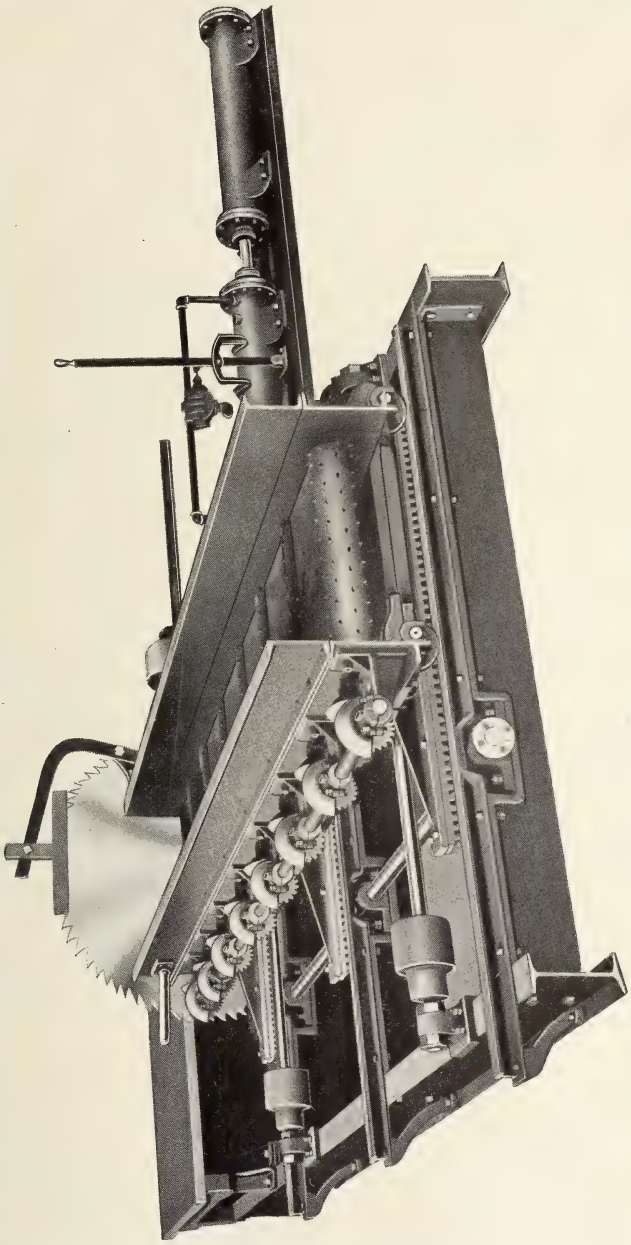

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Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

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THE PAPER ENQUIRY IN WASHINGTON.

The Mann Committee who have been hearing evidence in Washington on the question of whether there is an illegal combination of paper manufacturers to keep up the price of news print, as alleged by several of the publishers of one cent newspapers, have come to the conclusion that there is nothing in the allegation of the publishers. The majority report was to the effect that the present price of paper would not to any considerable extent be immediately affected by repealing the tariff, and that the passage of the Stevens Bill to place pulp and paper on the free list might probably mean ruin to the paper industry and eventually bring the cost of paper up to a ruinously high level. The majority in the committee therefore recommended that before any further steps be taken and particularly before any alteration be made in the United States tariff, that further investigation should be made and the results very thoroughly investigated. While being of opinion that it had been shown fairly conclusively that no combination existed among the manufacturers of news, the committee thought there was evidence to indicate that some sort of agreement had existed between the manila and fibre manufacturers, which had however now been dissolved. They practically admitted the truth of the manufacturers' assertions that the reason they had had to increase the price of paper was because of the increased cost of production due to the greater cost of pulp-wood and other materials entering into the manufacture, the increase of wages and reduction of hours of employees.

While stating its unpreparedness to make any recommendation as to a permanent duty on pulp and paper, the committee was firm in its belief that the tariff should not be removed from news and pulp coming from any country which prohibits or places an export duty on pulp-wood or on pulp or paper. Its ideas on this subject are expressed as follows:—

"The evidence taken so far would seem to indicate that the temporary sus-

pension or entire removal of the present tariff would not have any great immediate effect, and if the tariff is removed at any time it should be coupled with the right to free exportation of pulp-wood from the Canadian forests. The removal of the tariff on print paper and wood pulp, if followed by an export duty on pulp-wood coming from Canada, would probably result in a considerable increase in the price of print paper and the early destruction of the pulp-wood forests in the United States. A low or even moderate price for print paper in the future is dependent mainly upon the future supply and cost of pulp-wood. About one-third of the pulp-wood now consumed in the manufacture of paper by mills is imported from Canada. If an export duty should be levied by Canada upon the exportation of pulp-wood, or if the Province of Quebec should follow the example of the Province of Ontario and entirely prohibit the exportation of pulp-wood cut on its Crown lands, the cost of pulp-wood in the United States would be greatly enhanced and the price of paper would go up."

An interesting feature of the enquiry was the testimony of David S. Cowles, President of the American Paper and Pulp Association. Asked as to "what would be left of the paper industry in the United States in a few years from now if the Canadian Government should levy an export duty on pulp-wood and wood pulp," Mr. Cowles replied, "Little or Nothing."

There is some talk of the committee visiting Canada, and the result of such a visit would be of interest to all concerned.

The minority report, which was signed by two of the committee of six, was practically a substantiation of the publishers' charges and a recommendation of the passing of the Stevens Bill to repeal the duties on pulp and paper.

Meantime, John Norris has been appointed by the Newspaper Publishers' Association to look entirely after its interests in the campaign against the paper manufacturers, as announced elsewhere.

TO INVESTIGATE CANADA'S FOREST RESOURCES.

The Forestry branch of the Dominion Department of the Interior is about to carry on a most important investigation. Its object will be to gain a true and comprehensive idea of the forest resources of the Dominion, as to their extent and value, and the present rate of timber and pulp-wood consumption. A. H. D. Ross, lecturer in Forestry in the University of Toronto, will have charge of this inquiry, and will shortly be in Ottawa for that purpose. The department will avail itself, as far as possible, of existing sources of information on this subject, that is to say, the census statistics, as far as these go, the reports of the various Provincial Governments, and of individual travellers and explorers who have pushed their way into parts at present remote from settlement and from travel. Where the available information is confusing or inadequate, the Department will no doubt have examinations made by its own special agents, and in this way it will be possible for us to take intelligent stock of our natural resources in timber and pulp-wood. The move is a good one, because, notwithstanding the outstanding importance of these sources of national revenue and of a knowledge of their true status and rate of consumption, a great variety of opinions are still held on these ques-

tions. The work will be one requiring great labor, and a multiplicity of sources of information. We would suggest that means such as are now employed for the compiling of crop statistics in several of the Provinces be utilized for the purpose of obtaining accurate information from each district as to the area of standing timber and pulp-wood, the quantity burned over, the cut and disposition of the same. The United States Government makes use of its Census Bureau and Forest Service in collaboration for this purpose, and is enabled through the labors of these two departments to present some very useful data. Some concerning the production and sources of pulp-wood and showing to what extent they are used for the different varieties of pulp are given in another column. We hope that Mr. Ross will meet with every facility in carrying on his good work.

FOREST PRESERVATION.

The Montreal Board of Trade is a distinctly public-spirited body, and quite frequently takes the trouble to investigate problems which are of ultimate vast importance to the nation even though they may not immediately affect the pockets of a majority of its members. It is to be congratulated on the stand it has now taken in connection with a matter with which the Pulp and Paper Magazine has been closely allied for a long time past, and for which, according to information given in the preceding article, the Government, we are glad to note, has already made preliminary arrangements. The council of the above body, after a long discussion, unanimously passed a resolution asking for the appointment of a Government Commission to look into the whole question of forest resources and its closely related question of water powers. The resolution reads as follows:—

"Whereas serious inroads are being made into Canada's easily accessible timber supply and such denudation would greatly impair the efficiency of water powers and would also lead to the sterility of the soil, as is conclusively proven by the experience of other countries;

"Whereas according to the Department of Agriculture at Ottawa, the quantity of pulp-wood exported to the United States during the calendar year 1907 was 810,541 cords, and there is every indication of that amount being constantly increased;

"Whereas, the manufacture in Canada of this wood into pulp and paper would mean a great increase of industrial wealth;

"Whereas, this question of forestry and forest industries is a vital one for the whole Dominion of Canada, and it is advisable that the resources in question should be guarded and protected;

"Therefore, resolved, that the council of the Montreal Board of Trade hereby advocates the appointment by the Dominion Government of a Commission to investigate and report on the forest area and water powers of Canada; the quantity of timber of all descriptions manufactured in Canada, including that used by the pulp and paper industries; the quantity of timber used for pulp-wood manufactured in Canada, also the quantity of lumber, pulp-wood, pulp and paper exported from Canada, and the effect such exportation has had and is likely to have on the general prosperity

of Canada, and further to suggest what steps should be taken to further protect the extensive forest areas from fire, and the unlawful cutting of small timber."

BLACK PAPER FOR NEWSPAPERS.

A suggestion made in Appleton, Wis., and given wide attention in all parts of the country is to the effect that print paper should be made black instead of white. The idea is that by this plan old newspapers, instead of being burned or otherwise destroyed as at present, would be saved for making over again into fresh paper, which at present with white paper, cannot be done. The printing would, of course, have to be done in white ink, which the originators of the suggestion think would offer no objection. Were such a plan feasible, the saving in paper would of course be immense, and incidentally the destruction of pulp-wood forests would be largely minimized. Another point is that, by making black paper rather than white, many other fibrous woods besides spruce and hemlock might be utilized for the making of pulp. While we would not say the idea is wholly chimerical, we fancy it would require a long period of education before the public can be induced to read white type on a black background. Its effect upon the eyesight we do not pretend to know. There is one point, however, which would probably affect the scheme, and that is the deleterious effect upon the fibre of the paper of continuous working over.

SPAIN FEELS NEED OF FORESTS.

A suggestion by Spanish manufacturers that Spain plant forests for pulp-wood and follow Italy's example by planting quick-growing species has been reported to this Government by Consul-General Ridgely, of Barcelona. Spain is waking to the necessity of growing her own timber. Nearly all civilized countries are moving in that direction because it is coming to be understood that countries which do not grow their own timber must go without it for a few decades.

It has been customary to cite Spain and China as examples of the distressing results which follow forest destruction. Spain is as large as Pennsylvania, Delaware, Maryland, West Virginia, Virginia, and North Carolina, but its forests have only three-fourths the extent of West Virginia's alone, and much of them are scrub thickets of a very poor kind.

The country's population is believed not to exceed one-third of what it once was or what it might be again. Much of the denuded land is absolutely barren, with the red rock laid bare where agriculture once flourished. Hills, whose rounded forms indicate they once supported forests, are bald and without inhabitants. In some localities peasants, with hammers, pulverize rocks and make little patches of soil for gardens.

At the present time Spain's most valuable product is cork. The annual cut is 30,000 tons, but the cork forests are going, as other forests went, and for the same reason—want of care. Enterprising Spaniards are just now trying to supply their country with home-made paper, but pulp-wood is not to be had except by importing it. The home cut is only 2,500 tons a year—about what a single American pulp company would use in three days.

Foresters say that there is no reason why Spain might not do what France, her next neighbor on the north, has done, cover her barren places with forests, restore the soil, abate floods, mitigate droughts, provide employment for many, and furnish raw material for manufactures.—Forest Service, Washington, D.C.

PULP AND PAPER NEWS

The Great Western Townsite Company, St. John, N.B., has just concluded a deal with New York parties for $150,000 worth of pulp-wood.

* * * *

The Chicoutimi Pulp Company, Chicoutimi, Que., has lost a large number of logs, over 100,000 it is estimated, through the high water and the breaking of booms.

* * *

A bill to incorporate the Northern Pulp & Paper Company was killed in the New Brunswick Legislature, owing to the opposition of various lumber and fishing interests along the Tobique River, who claimed that the construction of power dams would seriously interfere with the work of getting out logs.

* * *

The plans for the new dam to be built on the Ottawa River have been approved by J. R. Booth, the E. B. Eddy Company and other hydraulic power owners, and work thereon is likely to be started as soon as the water is low enough. The Dominion Government is expected to make announcement shortly as to its plans for dams on the Upper Ottawa.

* * *

The Silent Typewriter Corporation is a company just incorporated in Albany, N.Y., with an authorized capital of $8,000,000, and in which Canadian capitalists are interested. Among these is Robert Kilgour 7 and 9 King Street E., Toronto, and Samuel J. Moore, 445 King Street West, Toronto. The company may eventually establish a factory in Canada.

* * *

The Copeland-Chatterson Company, Toronto, and the Rolla L. Crane Company, Ottawa, manufacturers of special ledger books, etc., have been merged together under the title of the Copeland-Chatterson-Crane Company, of Toronto and Ottawa, with a capital stock of $1,000,000. The new company will carry on the present businesses on an extended scale.

* * *

The Premier of New Brunswick is making efforts to have the Federal Government provide a larger amount in the estimates for the protection of New Brunswick timber areas along the line of the National Transcontinental Railway. Construction is now proceeding. In the last few years the Dominion Government has granted $3,000 per year for this service, but the area is now so increased that it is thought that the Dominion Government should pay at least $20,000 per year.

—The many friends of Major J. Fred Ackerman will learn with deep regret of his death which took place somewhat suddenly in New York, due to erysipelas. He was head of the Perkins-Goodwin Company, the well-known wholesale paper house of New York, and was well known in Canada, being president of the Ouiatchouan Falls (Que.) Pulp Company and a prominent member of the Canadian Wood Pulp Association. Among those present at the funeral were many prominent paper men, including George F. Perkins, formerly head of the old firm of Perkins, Goodwin & Co., David S. Cowles, W. D. Woodruff, of the Lincoln Paper Mills, Ltd., St. Catharines, Ont.

—High water in the Ottawa River last month considerably impeded operations in the lumber and pulp mills. The E. B. Eddy Company had to close its log mill temporarily. J. R. Booth's pulp and paper mill has not been much affected. The dry weather of the last weeks has improved matters.

—A correspondent in Amsterdam, Holland, asks names of manufacturers of paper bottles in Canada. At present there are no factories carrying on that industry in this country, though we believe there would be a good opening for such.

NEWS OF THE MILLS

The Davy Pulp Mill at Thorold, Ont., was closed down a few days last month.

* * *

The Gordon Pulp & Paper Company's sawmill at Dryden, Ont., has started operations.

* * *

The Riordon Paper Mills at Hawkesbury, Ont., had to shut down for a while last month owing to the floods.

* * *

The E. B. Eddy Company, Hull, Que., are putting on the market a cover for lard, candles, tobacco, etc., made of pulp.

* * *

The Metabetchouan Pulp Company, Quebec City, has decided to install paper machines at its mills at Metabetchouan, Que.

* * *

James Beveridge has already given out the contract for lumber for his new pulp mill at Millerton, N.B., desiring to have the mill completed as soon as possible.

* * *

The Laurentide Paper Company's mills at Grande Mere, Que., had to close down for a few days last month owing to the high water and floods in the St. Maurice River.

* * *

The Belgo-Canadian Pulp Company, Shawinigan Falls, Que., is now operating to its fullest capacity of 80 tons daily, having completed the installation of new machinery.

* * *

Interest on the first mortgage bonds of the Lake Superior Corporation will be paid as usual, in spite of the closing down of the rail mill and the blast furnaces, and of the fire in the paper mill.

* * *

The Windsor Mills, Que., by-law requiring all persons working in the paper mills to reside in the town, is to be rigidly enforced. Some thirty of the employees have been notified that they must move into the municipal limits at once.

* * *

Work is now proceeding as usual at the Miramichi Lumber Company's rossing mill, Chatham, N.B., where the men struck work owing to their wages being reduced from $3 to $2.50 and $2 per day. Other men filled their places.

* * *

The rossing mill at Morrison's cove is running day and night. The crowd from the Richard's mill forms the night workers. Two steamers have already loaded their blocks. There will be three boats on the route this season. The company has purchased the "R. R. Call" for a tow-boat, besides using the "Sarcella" and "Rex," and have disposed of the "Mascot."—Chatham N.B., Commercial.

* * *

Among the large contributors to the Quebec Battlefields Fund are J. R. Booth, Ottawa, who subscribed $500, the W. C. Edwards Company, of Rockland, $500, and W. H. Rowley, of Hull, Que., $50. The James MacLaren Company, of Buckingham, Que., gave $500 for the relief of the sufferers by the landslide at Notre Dame de la Salette, Que., and Alexander and Albert MacLaren personally each gave $250 for the same purpose.

* * *

The Canadian Pacific Sulphite Company, Limited, tested its plant at Swanson Bay, B.C., recently, when everything worked satisfactorily. The buildings comprise a wharf area of over two acres, a blow-pit room 39 x 67, built of concrete and wood; a fireproof boiler house, 65 x 60, made of concrete; digester building, 28 x 67; screen room, 40 x 60 feet, and a machine room, 40 x 252 feet. The sulphur storage rooms are 35 x 60 feet, while the sulphur burning rooms are 40 x 35. The cooler building is 40 x 40, with towers 30 feet square and 150 feet in height. The boiler house con-

tains five boilers, each of 208 horse-power. Water power to extent of 1,400 horse-power is obtained from Swanson Creek. The company will at present engage only in the manufacture of sulphite pulp, but will ultimately develop a plant for the manufacture of mechanical pulp, for which purpose the horse-power will be increased to 10,000, and the supply of water will come from Yule Lake, half a mile from the present works. The directors in London have decided to issue $65,000 debentures at 6 per cent., half of that amount at once.

* * *

Negotiations are still going on between the Pigeon River Lumber Company, of Port Arthur, Ont., and the council of that place for the erection of a pulp mill to produce from 40 to 50 tons of ground wood per day. The company asks the city for a free site, and for 5,000 electrical horse-power at a reasonable price, with fixed taxation for a term of years. It proposes ultimately to build a mill for the manufacture of newspaper for supplying Western newspapers.

LARGE PULP AND PAPER MILLS FOR KENORA.

Andrew Anderson,, of Winnipeg and New York, has submitted to the Kenora, Ont., Council on behalf of certain capitalists the outline of an immense pulp and paper industry which they propose to establish in Kenora, providing certain encouragement is given by the town in the shape of exemption from taxation for a period of ten years, and fixed assessment of $3,000 for a further period of fifteen years. The company proposes to acquire the water-power and lands of the Keewatin Power Co., and to erect an immense paper and pulp mill, with a capacity of 300 tons per day. The plant will cost in the neighborhood of $3,800,000, operations will commence on or about the first of October next. About $1,000,000 is to be expended the first year. When in operation the mills are to employ from 750 to 900 skilled workmen and 300 to 400 laborers. In addition from 3,000 to 4,000 men will be employed in the woods. The W. R. Hearst newspaper syndicate of New York also is reported to be about to establish large pulp mills in the same neighborhood, making use of the Norman power dam. The two reports may be in connection with the same scheme. We are endeavoring to gain further information.

An option has been secured until the 13th proximo on the Keewatin water power for $600,000, and one on 1,000 square miles of pulp land. The company binds itself to buy and develop the Keewatin water power, and to have the mill complete and in operation by June 1, 1911. Before taking any action, Mr. Anderson insisted that a by-law be submitted to the people authorizing the council to grant the company privileges re taxation as above.

—The Canada Engraving and Lithographing Company, Limited, the Union Card and Paper Company, Limited, and Camera, Limited, of all of which Lieut.-Col. Burland, of Montreal, is the president, have been amalgamated under the title of the Consolidated Lithographing and Manufacturing Company, Limited. The offices of the corporation will remain at 9 Bleury Street, but the manufacturing, engraving, lithographing and printing operations will be carried on at the company's factory on Parthenais Street, which has been considerably extended for the purpose, and in which an up-to-date plant has been installed.

—Resolutions passed at a recent meeting of Canadian shippers in the Board of Trade Building in Toronto, of which W. H. Rowley, president of the E. B. Eddy Company, Hull, was chairman, called for a clean bill of lading from the railroads; in other words, that they should receive and carry goods subject to the common law and statutes.

PULP-WOOD CONSUMPTION IN UNITED STATES.

The United States Census Bureau and Forest Service collaborated in collecting statistics on the quantity of different kinds of wood manufactured during 1907. The following table shows the consumption of pulp-wood by 258 mills during that year:—

Kinds of Wood.	Total Cords		Mechanical Process, Cords.		Sulphite Process, Cords.		Soda Process, Cords.	
	1907	1906	1907	1906	1907	1906	1907	1906
Spruce, domestic	1,793,278	1,785,680	882,173	826,511	898,824	845,470	14,281	13,699
Spruce, imported	905,575	721,322	380,647	290,080	524,577	428,742	1,351	2,500
Hemlock	576,154	528,381	21,248	11,869	541,113	516,512	13,793	.....
Poplar, domestic	352,142	310,920	16,903	10,475	1,536	.....	333,703	300,445
Poplar, imported	19,798	17,550	2,620	2,129	.....	.....	17,178	15,421
Pine	78,583	69,277	15,642	15,116	3,206	3,660	59,735	50,561
Cottonwood	66,084	26,871	18,630	24,400	35,374	471	12,080	2,000
Balsam	43,884	33,886	15,463	11,572	28,326	22,314	65	.....
All others	125,162	167,289	7,976	5,628	27,516	41,510	89,670	120,151
Total	3,962,660	3,661,176	1,361,302	1,197,780	2,059,502	1,958,619	541,856	504,777

Estimated total production of pulp, in tons, 1907, 2,547,869 1906, 2,327,844.

FAVORS A GOVERNMENT COMMISSION.

It would be good policy for the Canadian Government to take a leaf out of the book of our neighbors and appoint a commission composed of legislators. Why should not the inquiry be undertaken by joint committee of both Houses? The members are already paid for their services by the year. Their travelling is provided by the railways. All the expenses involved would be their mere living, and that of the reporters and secretaries of the committee. Such a committee of Senators and M.P.'s. would attract the public attention, even if only for its novelty.—Ottawa Free Press.

MANCHESTER SHIP CANAL.

The Manchester Ship Canal has been deepened from 26 feet to 28 feet throughout its entire length. Such is the announcement made by R. Dawson Harling, Canadian representative of the port of Manchester. The additional two feet of water has been obtained after more than three years of continuous work and at a very great cost, and marks another important stage in the development of Manchester as a seaport. This increased depth will materially affect the tonnage navigating the canal, and will serve to increase the confidence of shipowners in sending their vessels up this splendid waterway. It means that the vast majority of the cargo steamers of the world can now safely and easily load and discharge their full cargoes at Manchester, which in the case of the largest of these was not possible prior to the deepening of the bed of the canal.

—A large project is under consideration at Fraserville, Que., comprising the construction of large storage reservoirs to regulate the flowage of the River du Loup to a dependable constant. This will involve the construction of four or more dams, ranging from 450 to 800 feet in length and 20 to 35 feet in height. The work would be done by the town of Fraserville, subject to the plans and supervision of Kenneth L. Warren, M.E., Mem. Am. Soc. M.E. of Fraserville.

—In connection with the intention of the Improved Paper Machinery Company of Nashua, N.H., to build a factory at Sherbrooke, P.Q., in order to meet the growing Canadian demand for its products, the City Council of that place has decided to grant exemption from taxes for ten years, and in addition will give power at $17.50 per horse-power up to 40 horse-power, and above that at $15 per horse-power. The Council also agrees to give $1,000 towards the purchase of a site.

CHANGE IN THE CANADA PAPER COMPANY.

The negotiations in connection with the control of the Canada Paper Company, referred to in last issue, have been drawn to a successful conclusion, and Joseph Kilgour, of Kilgour Brothers, Toronto, has acquired controlling interest in the company, the change being ratified at the annual general meeting just held. Mr. Kilgour will put $150,000 into the property and will remodel two of the three mills owned and operated by the company at Windsor Mills, Quebec, so that they will be capable of a larger output. The former board of directors was re-elected as follows: Sir H. Montagu Allen, president; H. S. Holt, vice-president; Hugh A. Allan, C. R. Hosmer, Robert Mackay, H. M. Molson and Bryce J. Allan. Second mortgage bonds to the amount of $150,000 are to be issued. The authorized stock of the company is $600,000 common and $400,000 preferred. Of the common there has been subscribed and paid up $588,600, and of the preferred $344,100. Bonds of $200,000 are outstanding. The preferred 7 per cent. cumulative stock is preferred both as to dividends and assets stock. Details as to reorganization will be announced shortly. An aggressive policy will be adopted, and probably new territory covered.

—John Norris has resigned his post as business manager of The New York Times, to accept an appointment tendered him by the American Newspaper Publishers' Association for the promotion of the aims of the organization in the matter of news print paper. This appointment, which is in accordance with resolutions just passed by the directors of that Association, is for a term of two years, and is a direct result of the postponement of action by Congress upon the proposal to place pulp and printing paper on the free list, pending further enquiry. The publishers feel that the situation requires renewed efforts and a continued placing of their side of the case before the legislators and the public. Mr. Norris' first action is to set forth a scheme for pulp mill owners to install paper machines with guaranteed sale for their product.

BRITISH CANADIAN WOOD PULP AND PAPER COMPANY.

It is the intention of the British Columbia Wood Pulp and Paper Company, of Vancouver, to erect a pulp and paper mill on the Clowholm River, near Nelson, B.C., and they are now negotiating with the Water Commissioners at that place to supply 20,000 miners' inches of water for industrial and domestic purposes. At a special meeting of the directors of the company recently, W. Innes Paterson, of Vancouver, was elected a director of the company to serve until the next general meeting of the company of 1909. Mr. Paterson has long been identified with the lumber interests of British Columbia. In a comparatively short time the company have secured more than sufficient capital with which to install the first unit of the plant which is to have a weekly capacity of approximately 80,000 pounds of wrapping paper, and it will not be long before the company will be prepared to go on the market with the finished product. It has already secured a large amount of machinery and will ask for tenders on the main building shortly. It has now accommodation at Port Mellon for 80 or 100 men. The majority of the buildings are to be made of concrete so as to assure absolute fire protection, and plans are made so as to enable it to install a large amount of machinery while the building is under course of erection. The local agents of the company in Victoria, Harman & Dunnet, have erected on their premises a small demonstrating plant.

—Sir John Evans, K.C.B., F.R.S., of the Papermakers' Association of Great Britain and Ireland, is dead at the age of 85. He was connected with the papermaking industry since 1840.

THE ARGUMENT FOR GOOD PAPER.

A man who gets an estimate written on cheap paper, says to himself: "If this man skimps so on letter paper, he is apt to skimp on my work." Using poor paper is poor business, however you look at it, because the paper represents you, and you cannot prevent it. The safe thing is to use paper so good that you are willing to have your work or your goods judged by it.

First impressions are strongest. The first impression produced by your letter comes from the paper upon which it is written. Before the text of the lettter is reached, the "feel" and looks of the paper as it is unfolded creates a prejudice—good or bad.

Remember—the light in your eye and the grasp of your hand are absent in the written word. Avail yourself of every means to win a favourable reception for your letter—your silent representative.

After we have heard a man talk, it doesn't make so much difference what kind of clothes he wears. After we have read a letter, it doesn't make so much difference what sort of paper it is written upon. But as we see the man before we hear him, and the paper before we read the letter, it behooves the caller to give care to his dress, and the correspondent thought to his stationery.

CORNWALL PAPER MAUFACTURING COMPANY'S MILL FOR SALE.

—On the 22nd inst there is to be a judicial sale of the real estate, buildings, machinery and equipment of the Cornwall Paper Manufacturing Company, Ltd., at Mille Roches, Ont. Operations have been carried on to full capacity by the liquidators, the Trusts & Guarantee Company, Toronto, and with success, for a monthly deficit, we understand, has by them been converted into a profit. Business is reported very fair, and the mill has orders in hand for some weeks ahead. Unsystematic selling arrangements are blamed for the company's difficulties. It is understood that unless a satisfactory price be obtained for the mill and equipment it will continue to be run by the liquidators until a later date. Among the chief creditors are G. W. Millar & Company, J. V. Sergeant & Company, J. H. Lyon & Company, Troina & Defina, E. Butterworth & Company, of New York, and William Hughes, Brooklyn. The Canadian liabilities are few and unimportant. The plant is thoroughly up-to-date in every way. The buildings consist of a machine room, 85 x 180 feet; beater room, 65 x 180 feet; boiler house, 40 feet, and offices, 23 x 25 feet; all built of gray limestone throughout. The machine room and boiler room are floored with solid cement. The electric transformer house, separate from the main building, is of brick, 23 x 25 feet; there is also an ample storehouse, 30 x 100. There is a commodious wharf in close proximity, which accommodates vessels drawing 10 feet of water. The north end of the company's property extends to the Grand Trunk Railway track, from which sidings run to the company's mill and storehouses. The machinery and equipment consist of a paper-making machine built by Bentley & Jackson, of Bury, Eng., capable of making a sheet 110 inches wide. The supercalendered stack is 64 inches wide. The finishing room has paper cutters made by the Hamblet Machine Company. The beater room is equipped with two Pope & Mullen beating engines and two 15,000 pound bleaching engines; also with an improved Marshall refining engine. The boiler house is equipped with two large Goldie & McCulloch steam boilers of 150 horse-power each, fitted with the latest Jones underfeed stokers.

—Among recent crane shipments by the Northern Engineering Works, Detroit, Mich., are mentioned a 7½-ton, 3 motor electric crane at the Cummings Foundry, Chicago; a 7½-ton, 3 motor electric crane for the United Lead Co.; a 5-ton, 38 feet span crane for the West India Electric Company, and a 6-ton, 2 motor electric crane for Valentine Bohl Company, Waterbury.

SOME OLD-TIME BRITISH VIEWS ABOUT PULP.

At the present time, when so much attention is being given to Canada's pulp-wood and the manufacture of pulp generally, the following extract from the May, 1888, issue of "Paper-making," brought to our attention by Chas. J. Kay, manufacturers' agent in paper and mill supplies, Portland, Ore., showing the views some of our British paper-making friends held twenty to twenty-five years ago, will doubtless be of interest:—

"Our views upon the use of wood are, we should say, tolerably well known by this time. We are not disposed to regard wood as anything more than an inferior fibre; we may be wrong in this estimate, but if so, we shall at least comfort our conscience with having given our opinion honestly, fearlessly, and with every straightforward intention.

"Looking back some twenty years, we remember the rather timorous introduction of ground or mechanical wood pulp. It was not liked; maybe it was not properly appreciated; but at any rate it was pronounced useless, dirty, coarse, and altogether far too dear at the price. Mechanical wood then sold about £12 per ton. As years progressed and paper-makers began to get "cornered" in endeavoring to find a cheap and suitable loading, mechanical wood began to steal its way into certain classes of cheap papers. Now it is very extensively, and, we think, very advantageously used in preference to china clay. When our paper-makers arrive at that stage of their art which prohibits the use of china clay, they will begin to wonder how it was that this detestable stuff was ever used in making such a material as paper.

"The introduction of chemical wood was a more important event, as the pulp offered to paper-makers was at least pure, and consisted solely of fibre. Consumers' opinions upon this variety of wood varied considerably, both as to the quality and the price of the fibre But on consideration of chemical wood a little more closely it is generally conceded that this is by far the most convenient and generally urilizable kind of wood to use. If carefully made, and attention be paid in its various stages of preparation, chemical wood is a very useful fibre for general use. Yet there are certain qualities of paper in which wood in any shape is totally out of place. The most inconvenient feature about wood is its extreme lightness, which gives the pulp a tendency to float. Accordingly, if wood is used with good rags it will generally be seen to float to the surface and lie upon the top of the sheet of paper when made.

"Quite recently, that is to say within the past ten years, another variety of wood has been introduced, namely, the sulphite pulp.

"Perhaps it is only natural that a new system should at first be very imperfect and full of various defects as regards the subject of manufacture. This was, indeed, the case. Sulphite wood, until quite recently, was carefully eschewed by paper-makers, who found all kinds of fault with the new material. But within the past year or so great improvements have taken place, and, as we pointed out in our last issue, we are now able to depend upon sulphite wood pulp for regularity of quality.

"Wood is certainly very useful as an assistant material, particularly if the stock to which it is added be strong. We have promulgated this opinion for some years, and have more than once instanced the mixture of jute stuffs with wood as very beneficial for certain qualities of paper.

"The difficulty to avoid is indulgence in a rabid kind of enthusiasm, which leads some people to think and say that because good news or ordinary printing papers can be made with wood, that every other class of paper can, even including good writings and

bank notes. We have frequently had this view expressed to us confidently by wood enthusiasts, who certainly could not be treated as sane individuals

"There are now many very knowing people, and journalists also, who look upon wood as the essential essence of all excellence in fibre, and as the coming supply for every sheet of paper that is to be made in the future. This, of course, is so much nonsense. We also think it would be foolish to deny the great and increasing utility of wood, the amazing energy and intelligence which have been expended upon this fibre, and the strong hold it possesses in the trade. We grant all this freely and with much pleasure; all we would warn the trade against is overestimating the temporal benefits which the use of wood had conferred upon paper-makers. Rags, nowadays, are very cheap, and, therefore, will become very scarce; it will no longer be possible to induce their collection when dealers can give nothing, or next to nothing, for them. The rush is after wood. Rag dealers deserve the disrepute which attaches to their calling, for it has been long a business composed of 10 per cent. of honesty and 90 per cent. of roguery. Paper-makers, both at home and abroad, began to find as prices cheapened that they could not get a rag to be depended upon; consequently their attention was speedily given to any new material offered them. It is a thousand pities that rag merchants should not have forseen the inevitable consequences of such trading as they are said to be notorious for. There is no fibre so easy to boil and clean, and, in fact, prepare generally as the old stock, and it is a shame to think that paper should be driven down to be made of wood because the latter article cannot be adulterated. We don't mean to say that all wood pulps are pure, but when a paper-maker prepares his pulp himself he knows and can see for himself that his raw material is at least pure and free from admixture of various qualities."

Note the words: "We would warn the trade against over-estimating the temporal benefits which the use of wood has conferred upon paper-makers." What is the situation to-day? Men of foresight are realizing that at the present rate of consumption steps are necessary for enforcing reforestation and the adoption of proper regulations which will not only ensure a steady supply for the future, but a husbanding of the present supply.

CEMENT-ASBESTOS SHEETING.

Cement-asbestos sheeting, although extensively made and used on the Continent in the form of slates and tiles for roofing purposes, has not received the attention it deserves at the hands of paper-makers is the opinion of "World Paper Trade Review."

To put it shortly, as its name implies, the material is simply composed of asbestos fibre and Portland cement, in the proportion of from five to ten parts of cement to one of asbestos fibre, according to the degree of hardness and waterproof qualities desired. The cement, therefore, greatly preponderates, the asbestos fibre chiefly acting as a binding material to give strength to the sheet and render it more fire-resisting. If preferred, any other suitable fibre may be used in place of asbestos.

The process of making the sheets is as follows: The crude asbestos having received the preliminary treatment necessary to reduce it to a fibrous condition, is put into the beating engine, where the fibres are well drawn out, long, equal fibres being preferable to short stuff. It is then admitted to an ordinary mixer provided with agitators, and incorporated with the required proportion of cement, and only sufficient water should be used to make the pulp flow freely. The pulp should be used shortly after being made, or

the cement it contains will deteriorate in strength.

Up till the present, in this country, machines of the millboard or presse pate type, altered to suit the new conditions, have been used, but what has been done is little more than of an experimental nature.

The simplest method of making the sheets is by an adaptation of the ordinary vacuum filer, commonly used by chemical works. This costs only about one-fourth the price of a millboard machine or presse pate, which as used in a paper mill, will not make cement-asbestos sheets to give complete satisfaction, owing to the large amount of waste entailed through the cement and fibre passing through the meshes of the wire cloth. In the vacuum filter this wire cloth would be replaced by a layer of felt, or filter cloth, which effectually prevents any cement or fibre in the sheet being lost in the process of manufacture. The sheets on leaving the vacuum filter would be still too wet to stand much handling, so, therefore, would require to be deposited on metal plates for easy transportation.

The next process is the pressing of the sheets in a hydraulic press, in order to get rid of the excess of water remaining in the sheets, and to consolidate and reduce them to the required thickness. This pressure should amount to at least 250 pounds per square inch (of the sheet), and considerably more than this is preferable if it can be obtained. The press, however, can be supplemented, if not dispensed with entirely by other methods, which would not only give the desired pressure, but also ensure that every sheet was of the same thickness, which does not necessarily follow with the ordinary hydraulic press. Treating the sheets in the press alone, however, appears to be generally in favor. On being taken from the press the sheets should be laid aside for two or three days to set and harden, and thus acquire sufficient strength to be easily handled without damage. They can then be cut to required size by a guillotine of the shearing machine type, as the ordinary mill guillotine is not suitable.

The finished sheets may now be set aside to mature, when they will be ready for use. The length of time this will take varies according to the proportion of asbestos fibre and Portland cement, and the quality of the latter. In a case where the pulp was literally drowned in water, and the strength of the cement it contained very much reduced, it required about three months before it was in the best condition for use. But with the vacuum filter, where little water is used and all the cement is retained in the pulp, the period required for maturing the sheets would not be more than two or three weeks.

The sheets, however, should not be stocked too long before being used; otherwise, following the natural tendency of Portland cement to increase in hardness with time, it would not be so easy to drive a nail through the sheet when fixing, and the holes might require to be drilled, which entails much inconvenience and labor. The sheets, therefore, should be used when they are more or less in the "green" state.

The enterprising foreigner, who has in the last few years reaped a rich reward from the manufacture of this material, has usually contented himself with making sheets of small size to be used as slates and tiles for roofing purposes only. It is just as easy, however, with the vacuum filter already mentioned, to make the sheets of large size, say, 6 feet by 3 feet, or 5 feet by 2 feet 6 inches, for which there appears to be a good demand in this country.

The fact that in most cases the sheets when made are not sufficiently waterproof, but require to be painted to render them so, has, perhaps, militated somewhat against the more general adoption of the artificial in place of the natural slate. By correct methods of mixing and manufacture this waterproof quality should result as a matter of course. Where, however, a difficulty is experienced in making the sheet as

waterproof as could be desired, it can be finally rendered so in a very simple manner without relying upon the use of paint.

It may be just as well to point out that the usual thickness of sheet is from one-eighth inch to three-sixteenth inch, and the simplest and cheapest method of applying this material to roofs is that known as the colonial system, care being taken to allow plenty of lap for horizontal joint, and to ensure that all vertical joints are rendered staunch and watertight by bedding the strips over these joints on to putty, or thick red or white lead.

In conclusion, one most important point may be mentioned. The materials of which this sheeting is made are cheap. Canadian asbestos can be obtained for as low as £6 to £7 per ton, and Portland cement costs very little. The finished material can be sold at a good profit, as the working expenses are low.

In view of the fact that in some mills, owing to the high cost of raw materials, paper can hardly be made at a profit, it is a matter of surprise that the paper-maker has not taken more interest in this comparatively new product, and thus shared the large profits which at present go into the pockets of the foreigner.

ENGLEMANN SPRUCE AS A PULPWOOD.

Englemann spruce is a comparatively small tree of rather slow growth whose range is on the high slopes of the interior mountain system from British Columbia southward to Arizona and New Mexico. Within this range it is used to some extent for lumber, mining timbers, ties and general construction, but it has not been considered a very valuable lumber tree and it is employed only because of lack of better material. No estimate of the total amount of standing timber is available, but reports of stands show more than one and one-half billion board-feet as occurring on four of the United States National Forests, and this is probably only a small part of the actual quantity standing. Throughout its entire range there is much material in the form of dead and mature timber.

The existence of such quantites of a wood of seemingly little value has induced the United States Forest Service to undertake experiments to determine whether this wood can be used for making paper pulp. Samples have been received from the National Forests of Wyoming, Colorado, and Utah. These have been treated by the sulphite process and a pulp has been obtained which, unbleached, is, in color, nearly as good as pulp made from Eastern spruce under similar conditions, and in strength, cleanliness, and other qualities seems to be fully as good. The results of preliminary trials on seasoned wood show that it cooks without difficulty and gives a yield of fibre nearly equal in volume to that from its eastern relative. The amount of screenings is very small, being between two and three per cent. Tests made on the fibre show that it bleaches quite easily, the amount of bleach varying with different cooks, but in general it may be said to require about the same quantities as fibre produced from Eastern spruce.

A few cooks have been made on green wood, cooked within two months of the time the trees were cut, and the indications are that it will require a little higher temperature than the seasoned wood. The fibre produced from green wood, however, seems to be fully equal to that from seasoned wood, and is superior to it in color.

The fibre of Englemann spruce seems to be slightly shorter than that from Eastern spruce, but it is of sufficient length to be used for the latter in nearly all of the manufactured products, and there is apparently no reason why it should not be so used, provided the other conditions of manufacture and transportation are favorable.

EXPANSION OF FIBRES BY DAMPING.

R. W. Sindall, F.C.S., writes in the Paper Makers' Journal on the behaviour of papers when damped, a peculiarity well known to paper makers and printers. For certain purposes it is desirable that paper should not show any material alteration when damped, since any expansion of the sheet is liable to throw the printing out of "register." The liability of papers to such stretch or expansion is largely minimised by careful manipulation of the pulp during the process of beating, and also by a proper regulation of the web of paper as it passes from the wet end of the paper machine over the drying cylinders to the calenders. The paper which fulfils the necessary qualifications as to a minimum stretch is prepared from pulp which has not been beaten too long a period, so that the pulp obtained is fairly light and bulky. By this means the expansion of the fibres takes place in the sheet itself without making any material alteration in its area. That is to say, as the sheet of paper is fairly open there is sufficient room for the expansion of the fibres owing to the air spaces which exist between the fibres. The expansion thus takes place with the least alteration of the total area of the sheet. The paper which is allowed to shrink on the machine during the process of drying without undue tension usually exhibits a minimum amount of expansion subsequently in printing.

It is important to notice that the expansion of paper is different for the two directions—that is, for the machine and cross directions.

This arises from the fact that in a machine-made paper the greater proportion of the fibres point in the direction of the machine while the paper is being made. In consequence of this the expansion of the paper is greatest in what is known as the cross direction of the paper—that is, in the direction at right angles to the flow of the pulp along the machine wire.

This is to be explained by reference to the behaviour of the fibres when damped or brought into contact with an excess of water. The question of the exact changes in the dimensions of a fibre due to absorption of water has been dealt with in an interesting manner by Hohnel. He points out that the well-known peculiarity of the shrinkage of ropes which have been lying in the water can be explained by an examination of the behaviour of the single fibres. He relates in detail the experiment which can be carried out for the exact observation of the fibres when in contact with water. A dry fibre when soaked in water appears to become 20 to 30 per cent. greater in diameter, whereas in length it is usually only increased by one-tenth per cent.

The method adopted by Hohnel was to place a fibre of convenient length on a glass slip, down the centre of which was a fine narrow groove capable of holding water, so that the fibre could be wetted. Over the fibre was a cover glass with a small scale marked on it.. The loose end of the fibres passed over a small roller, and was stretched by a light weight. The movements of the fibre were measured by means of an eyepiece micrometer, the exact value of which was shown in terms of millimeters.

In this way it was possible to determine alterations in length to within 0.05 per cent., and this variation could be directly seen under the microscope.

Hohnel observes in his account of the experiments that all fibres become thicker when wetted, that vegetable fibres are more susceptible than animal fibres.

Animal fibres expand about 10 to 14 per cent. in diameter, but vegetable fibres as much as 20 per cent., as shown in the following table:—

Animal Fibre.

Human Hair	10.67	per cent.
Angora wool	10.2	"
Alpaca wool	13.7	"
Tussah silk	11.0	"

Vegetable Fibre.

New Zealand flax...	20.0	per cent.
Aloe hemp	25.8	"
Hemp	22.7	"
Cotton	27.5	"

The reverse is the case when the expansion of the fibres in regard to length is considered, since animal fibres expand 0.50 to 1.00 of their length, and vegetable fibres only 0.05 to 0.10 per cent.

The maximum amount of expansion in the case of the vegetable fibres is obtained by gently breathing upon them, rather than by the use of an excess of water.

These figures are important as explaining many of the peculiar characteristics of vegetable and animal fibres. Advantage is taken of the greater expansion of the latter in the manufacture of instruments for the measurement of moisture, such as the hair hygrometer, in which the elongation of a stretched hair registers the variation in the moisture of the atmosphere.

EFFECTS OF STARCH SIZING.

The effect of starch sizing was treated by Herr Alfred Lutz, assistant at the Gross-Lichterfelde Testing Establishment, in competition for a prize offered by the German Society of Cellstuff and Paper Chemists.

He calls attention, in the first place, to the fact that while in laboratory experiments a number of different tests can be conducted upon the same general principles, in actual practice uninterrupted working on the same lines is a primary requirement. His first object was to determine whether the effect of starch prepared in a certain way varies according to the character of the fibres to which it is applied. For purposes of comparison the contents of each hollander used were divided into a given number of exactly equal parts, one part being free from the addition of starch, while the other had equal quantities of starch, the manner of its application varying in each case as follows:—

First, an accurately weighed quantity of crude potato starch was stirred, during the gradual addition of cold water, being then mixed with the pulp.

Second, an equal quantity of starch was stirred with as little cold water as possible, then poured into boiling water and the mixture heated to effervescence over a strong flame (this taking about a minute). The paste remaining was mixed with the pulp.

Third, an equal quantity of starch was divided into two parts, successively treated according to the directions contained in the above paragraphs. When the latter had cooled it was mixed with the pulp, the same course then being pursued with the former.

Fourth, an equal quantity of starch was gradually stirred with ten times the quantity of water and then poured into a 10 per cent. soda-lye. The quantity of the lye was so adjusted that 100 parts of dry starch correspond to 12½ parts of dry caustic soda. The tough, glassy paste thus obtained was slowly stirred with distilled water, until a 1 per cent. dilution of the dry starch was obtained, being then mixed with the pulp. An addition of sulphate of alumina was then made, in the proportion of 3 per cent. of the dry pulp.

Fifth, an equal quantity of potato starch, specially prepared with acid or dry heat, was dealt with as in the second direction given above, and mixed with the pulp. The paste thus produced frothed less in boiling, being lighter colored and more transparent than that made from ordinary starch.

While space precludes quoting the detailed results of the tests made with the above samples, it is of interest to note that they were carried out with two separate classes of pulp—bleached cotton pulp and bleached wood cellstuff. The proportion of air-dry pulp in the paper tested was about 49 per cent. in the case of the unsized cotton pulp and

45.5 per cent. in that of the unsized wood cellstuff.

With reference to the historical aspect of the question, it is stated that during the period between the eighth and fourteenth centuries papers were in use which had been sized only with starch. Although the requirements of that period were less exacting than those of the present time, Herr Lutz considers the discovery of the methods then used in connection with starch sizing as a problem deserving attention. He remarks that in no case has he been able, through the addition of starch to the pulp (whether potato, rice or wheat starch, crude or in paste), to obtain a paper satisfying even moderate requirements as to strength of size. Alkaline starch proved the best, whether added to the pulp or in the form of surface sizing.

Other portions of the prize essay deal in detail with the effect of the manner in which starch is used, on the results obtained by its use, and upon the strength of the paper produced.

The influence of the various kinds of starch on the strength and character of the output is further discussed at length. Owing to its large granular dimensions, the best results are said to be obtained with potato starch in crude form. In making it into paste, the temperature of 58.7-62.5° C. (about 137.7-144.5° Fahr.) should not be exceeded. On the other hand, rice starch by reason of its very small grain, produces an inferior result in the crude state to that obtained in a paste. Wheat starch was found to give in both forms satisfactory results.

Herr Lutz, in summarizing his remarks, states that starch is nowadays usually added to paper with a view to giving it feel and rattle, while by the addition it makes to the weight it may be regarded as paying for itself as a filler. He recommends caution in its use when a pure, fresh, white color is desired; his experience showing that in this respect its employment leads to unsatisfactory results. Its use with weighted papers is said to remedy the flabby feel noticed in such cases. His various tests seem to have indicated that even 2 per cent. of rosin produces results unattainable with even 10 per cent. of any of the three kinds of starch.

When starch is used he recommends its employment in the cheapest form, by adding it in crude condition in the hollander, only using it in paste with weighted papers.

WOOD FLOUR.

The production of wood meal or wood flour of which the principal consumers are the manufacturers of dynamite and paper—the latter principally for low-grade blotting paper—has reached such proportions in England, Germany, and other European countries, that in many districts—notably in the Harz mountains—the mills have difficulty in supplying the demand. We are able to give from a German paper some particulars of the processes used in its manufacture in that district. The necessary machinery is by no means so costly and complicated as that for wheat flour or rye meal, nor does it require so much power, says Kohn, in the Mitteldeutscher Holzmarkt und Forstanzeiger, although this statement is so general that it may be taken with a grain of salt, as there is no means of comparing the necessary amounts of power for two industries so widely different. The whole outfit consists of one or more sets of millstones or their equivalents, and a number of cylinders in which to press the ground product. The raw material out of which the meal is made is sawdust; not, as many suppose, wood blocks such as are used in making wood pulp. Pine sawdust—or rather more strictly speaking that of the tanne, as there is much confusion in the nomenclature, especially among the Coniferae, in any case the tanne is preferred on account of the superior whiteness of the meal made therefrom. The sawdust is worked up just as it comes from the sawmill. In the Harz district there is no drying apparatus for the un-

ground sawdust; this is not absolutely necessary.

The first process is screening or bolting in cylindrical sieves clothed with wire gauze. The main portion of these bolts is covered with Nos. 4 and 6 gauze, the lower end with a sheet having centimeter (0.4-inch) openings. This process separates from the sawdust the splinters and chips of wood, and equalizes the material which is to be worked up. Special care is observed that no pieces of iron or steel remain in the sawdust, such as nails, pieces of saw teeth or plate, nuts, screws, etc., as these would be likely to cause fire should they go between the millstones. In order to lessen the danger of fire, the bins for sawdust and meal are made of sheet iron.

In general, the stuff is ground about as fine as middlings for cattle-feed, and the number of turns per minute of the stones is about the same as for that work. The power required for a run of stones is about the same as for average rye grinding; naturally, however, damp or wet sawdust requires more power than dry. As a regular supply of the sawdust to the stones is difficult, the following method is adopted: There is above the apparatus on the floor where the sawdust is delivered from the bolts an upright cylinder in which runs a vertical shaft which bears at its lower end, on the bottom of the cylinder, two horizontal sweeps. The cylinder bottom is closed by a slide which controls the outlet to the millstone hopper. The sweeps keep the sawdust loose and in constant motion, and let it all through the lower opening in a stream, the size of which naturally depends upon the amount of opening of the controlling slide.

The best stones for this milling process are of sharp-grained sandstone—the so-called "head-stones" (Kopfsteine). The drier and finer the sawdust, the greater the output of a run of stones. The ground meal is, on account of the danger of fire, received in iron boxes; and it is prudent not to have the boxes in direct communication with the stones. The bolts for the meal are clothed with silk gauze. The meal is usually made in two grades of fineness—called Nos. 0 and 1. For the so-called No. 0, the bolts are clothed with No. 2 or 3 gauze; for the No. 1, gauze No. 0. This clothing is according to the degree of dryness of the sawdust; the dryer the raw material, the finer the gauze required. For this reason, the bolting-reels are provided with removable cover-frames. Some mills use instead of silk bolting-cloth a simple covering of "mull."

The meal is shipped either in large sacks, very tightly packed, or in bales of about a cubic meter, or say 40 cubic feet capacity each, which are compressed in a stout press. Shortly before baling, the meal is slightly moistened, in order to make it bale better. Incidentally, where such material is sold by the ton, this moistening process is not to the disadvantage of the manufacturer. The ratio of the price of sawdust to that of meal is somewhat different from that between rye and rye meal. Wood meal No. 1 costs on the average 2.75 marks a German hundredweight, 112 lbs. avoirdupois, delivered at the mill; No. 1 from 1.75 to 2 marks.

FANCY STAINED PAPERS.

In the manufacture of fancy stained papers, the pattern of which corresponds to the primary paint applied to the paper and comes out by a darker tone only, it was necessary heretofore to use a paint to produce such darker tone. In most cases many attempts or tests were necessary to secure the tone suitable for the purpose, such attempts or tests causing a great waste of time, especially if the paint must be produced by mixing.

A liquid composition has been invented by R. Schmiedel, of Dresden, Germany, and patented under United States patent No. 882,916, which has for its object to dispense with the use of paint in the production of patterns of the kind mentioned above to economize or save

time, and also to secure an image of clearer and more brilliant color.

The composition can be used for stained paper of any kind, no matter whether its surface is dead or brilliant, pressed or smooth. Dead paper does not become brilliant by its use and a brilliant one does not become dead or subdued, and the smooth and pressed surface of the paper is maintained and the brilliancy of glazed, bronze, or mica papers is not altered.

The composition, which is in liquid form, is used in combination with or during applying the pattern to the paper provided with the primary color, such applying or covering being effected by a mould, brush, or any other suitable means. This liquid or mixture consists of the solution of a moist, colourless substance or agent, which after evaporating of the solvent, adheres as a precipitate to the fibres of the paper and acts on the primary paint adhering to such paper by darkening.

The composition consists mainly of a diluted and easily drying mixture at the ordinary temperature of an agglutinant soluble in water or alcohol with soap, oil, glycerine, alcohol, and water. The said agglutinant may be glue, gum arabic, dextrin, or the like.

The denaturization of the alcohol may be effected by wood alcohol, shellac, camphor, turpentine, formaline, animal oil, benzine, petroleum benzine, castor oil, soda lye or various salts.

According to the value or importance attached more or less to the ardor, clearness, and beauty of the color tones produced by means of the present invention, the liquid used consists either of a very volatile solvent, as alcohol, benzine, carbon, tetra-chloride and the like, and a resin soluble in such agents, as colophony and the like, or a solvent evaporating not so quickly. The finally prepared mixture is neutralized by acids.

It has been found as well suitable for the purpose of the following mixtures, which produce the tones to be obtained in all primary colors:—

30 grams glue,
40 " gum arabic,
10 " glycerine,
40 " dextrin,

40 grams alcohol,
30 " soap,
60 " water,

or

30 grams dextrin,
30 " glue,
30 " tannin,
30 " alcohol,

30 grams soap,
30 " water,
30 " glycerine,

or

50 grams gum juniper,
20 " glue,
10 " glycerine,
30 " soap,

10 grams turkey red oil,
50 " alcohol,
80 " water,

or

30 grams fish glue,
20 " tannin,
30 " glue,
30 " resin from fruit trees,
50 " soap,

50 grams alcohol with addition to 25 grams colophony,
80 grams water,

or

50 grams gum dragon,
30 " casein
30 " gum arabic,
50 " alcohol,

30 grams soap,
50 " dextrin,
70 " water,
50 " oil.

According to the primary tone to be printed and to the brighter or darker color tone to be produced on it, the composition mentioned above may be of a higher or lower degree of strength which may be obtained by using the agglutinative substances, as dextrin, glue, resin, and the like in greater quantities, or the addition of water may be a greater one if the tone to be produced shall be of a greater or smaller brilliancy.

By this means it is claimed that it is possible to obtain the clearest, warmest colors, for instance, turkey red, cherry red, etc., with the paint of a warm tone shadow, which cannot be obtained by means of other processes. Furthermore, in stained patterns printed on paper or by lithography, and in another suitable mechanical manner, it is possible to produce each tone shadow within the tones created by the transfer of an effect in each finished image, as for instance in flowers, the primary colors, red, blue, green, yellow, can be shadowed simultaneously and at once with the use of the paints, according to the present invention.

CANADA'S PULP-WOOD FORESTS.

J. H. Worman, United States Consul at Three Rivers, gives the following information to his Government on the utilization of Canadian and Newfoundland forests for paper-making material, and of the effort to conserve the timber resources in the Dominion:—

American capitalists have bought some 500 square miles of valuable timber areas in Newfoundland and will at once begin the erection of mills for the manufacture of pulp.

One large American paper company, owning extensive and valuable forest areas in the Province of Quebec, notably along the St. Maurice River, with mill headquarters at Three Rivers and Batiscan, has recently acquired vast areas on the lower St. Lawrence, and is running mills in Gaspe County, Quebec. From its Three Rivers and Batiscan mills exports are made not only to the United States but also to England, the European Continent, and South America. The same company has also recently acquired large timber interests in New Brunswick, for which the consideration is said to have been $250,000. It is also reported that it is negotiating for lumber and milling interests at Marysville, New Brunswick, which will include, if carried out, the Blackville plant and the timber limits and licenses on the Nashwaak. The consideration is reported to be over $2,000,000.

The pulp and paper mills of Wisconsin, Michigan, and Pennsylvania have this year been seeking pulp-wood on both the Quebec and Ontario sides of the border adjacent to the territory tapped by the Temiskaming and Northern Ontario Railway. They are buying all the material available for delivery this season and in some cases making contracts for supplies for several seasons ahead. Wisconsin parties who own pulp-wood areas on the Quebec side of Lake Temiskaming are planning to cut their timber this winter into 16-foot lengths, raft it in the spring down the lake to Haileybury, where the Temiskaming and Northern Ontario Railway is building a spur line to the wharf, rail it thence to North Bay, where it will be dumped into Lake Nipissing, to be again rafted to Georgian Bay, and thence transferred for loading into the company's barges for conveyance to Wisconsin.

RECIPROCITY WITH CANADA.

Samuel A. Cook, a Wisconsin paper manufacturer, suggests that the paper manufacturers join the newspapers of the United States in asking the present Congress to reduce the tariff on news print paper manufactured in Canada, leaving enough margin of tariff to protect American labor, provided Canada allows pulp-wood to be shipped into this country from Ontario, the same as she now does from Quebec, so that the paper manufacturers of the West may enjoy

the same privilege as the manufacturers of the Eastern States now do in receiving their wood pulp. "If, he says, "the United States removes the tariff on paper and Canada prohibits shipments of her pulp-wood into this country, as she is now doing from Ontario, it is plain that the business and labor interests of this country must suffer. I believe it a good business proposition for the press of this counrty to join the manufacturers and look into this matter candidly to decide where and at what price they may be able to get their paper in case this Congress removes the tariff on paper on any other than the reciprocity lines above indicated."

PAPER FOR ADVERTISING PURPOSES.

The following is an account of a paper which has met with great success in Germany for advertising purposes, owing to its striking appearance:—

The main mass of the paper is made from cellulose, waste paper from former makings, and a little chemical wood pulp. An unbleached cellulose of medium quality is used, and a few splinters in it are no objection to it. The wood pulp must be good, and the paper should be rag paper as far as possible, and not wood paper. A good grinding in the beating engine is essential, and it is dyed during the process to any desired color. Light grays, yellows, and salmon color are favorite tints.

Shortly before the mass leaves the vat it is mixed with cocoanut fibre cut into lengths of from one-fifth of an inch to an inch, and colored so as to contrast as sharply as possible with the paper pulp. This fibre is naturally of a pale to a dark brown, and is used for making stair carpets, ropes, mats, etc., and such articles are frequently made from it in prisons. All places where they are made can supply the paper-maker with waste cocoanut fibre in the form of trimmings cut from edges, etc. The pieces bought by the paper-maker average four inches in length, and must be chopped up by hand or in a suitable machine. They should, however, first be sieved to secure the pieces which require no chopping. The chopped fibre must be washed if it is very dirty, and dried in the air. Dark brown fibres can be added to the paper mass as soon as dry; but light colored ones must be dyed, so as to contrast with the pulp, as above insisted upon.

It must be remembered in determining how much dye to add to the dye bath that the natural brown cocoanut fibre is not easily hidden. The dyed fibres are partly dried on sieves, but without artificial heat In cold weather, however, they can be dried in the drying-room; but even in this case the heat must be kept low. The dyeing itself is done cold, at the boil, or at an intermediate temperature, according to the dye used. When the fibre is nearly dry, it is thoroughly rinsed to remove superfluous dye. The rinsing must not precede the dring, and the drying must not be complete, as then the superfluous dye would dissolve off only with great difficulty. Its removal, however, is essential. Any that is left will, when the pulp is being made into paper, come off in solid particles, and ruin the whole batch with ugly stains. The paper must be fully sized. To remove lumps from the pulps the catch-plates of the pulp strainers should have rather wide slots, as narrow openings would keep back most of the cocoanut fibre as well as the lumps.

The paper is damped on the machine and sharply satined. This calendering is necessary to bind the cocoanut, which, which, on account of its lightness, is mostly on the surface, more firmly into the paper. Even after calendering separate cocoanut fibres can be scraped out with the point of a needle. For the same reason the paper should not be made too light—eighty-five grammes per square metre, or, say, three ounces to the square yard, is about the least weight possible.

For printing purposes it is advisable to load the paper with a little China

clay or talc, or any other mineral white.

The surest method of testing whether the cocoanut fibre is worked into the paper as well as possible is to fold a sheet of the paper in two, and then to rub one half over the other. If no loose ends of cocoanut fibre appear, the paper may be regarded as satisfacory.

In conclusion, every machine that has been used for making this paper must be got free from even the least scrap of cocoanut fibre before it can be used for making paper of any other kind.

CANADIAN PAPER ON EXHIBIT.

In the Canadian Pavilion in the Scottish Exhibition there is an interesting exhibit showing the various papers made from the wood with which the Dominion is so plentifully endowed. It is computed that there are altogether 1,657,600,000 acres of forest in Canada, so that wood pulp should never go down, especially as the trees are always growing up again. The papers are in different tints and qualities, pleasingly displayed, and for convenience of visitors getting away there are samples of different papers in the form of a large roll so hung that a piece can be torn off. There are also numerous paper bags for all purposes—seeds, cigars, combs, etc., of all shapes and patterns. The exhibit is good evidence of the resources of the Canadian mills and is well worth the attention of men in the trade.—Paper Makers' Monthly Journal.

A NEW POSTAL WRAPPER.

All know the difficulty experienced in removing the postal wrapper from a tightly-rolled magazine or newspaper without tearing or injuring its contents, and although several ingenious devices have from time to time been introduced to alleviate this difficulty, none can excel a new wrapper introduced recently in London. It is termed the "Patent Pleated Wrapper," and for ease of opening it is said to be hard to beat, while it is so simple to manufacture that it can be sold at a moderate cost. A narrow pleat having a width of three-eighths of an inch, gives a treble thickness of wrapper at a point near to the closing end; one end of the pleat is cut to form a tab that may be easily taken between the fingers, and to open the closed wrapper it is only necessary to take hold of this tab and pull, when the pleat tears away, and the contents of the wrapper are released.—Paper Dealer.

WATERMARKING OF TISSUES.

A paper-maker contributes to the Papier Zeitung a short note on the manufacture of so-called Chinese tissues with watermarks. These tissues are made of long-fibred soda or sulphate wood pulps, and do not retain sufficient water after passing the first suction box to take a clear impression from the dandy roll. The writer has arrived at a workable process for watermarking these thin tissue papers by taking away two of the register rolls which support the wire not far from the slices and placing the dandy roll between the deckle straps on the portion of the wire thus made vacant. It is also advisable to arrange a rubber cloth so that it runs with and underneath the wire and prevents the too rapid escape of the water. Such a device is well-known to makers of tissue papers. Still it is possible to work without going to this trouble, but in that case the concentration of the pulp must be adjusted accordingly. In any case the manufacture of these water-marked tissues is attended by a large production of "broke" unless exceptional care and experience are devoted to it. For this reason orders are frequently refused in spite of comparatively high prices. As a specialty, however, there is a considerable profit to be earned in this class of work.

DIRECT AND INDIRECT CELLULOSE BOILING.

To judge by all the advantages claimed for improved types of hollander, the machine ought to work by magic, and turn out the very best pulp from the most inferior material. The following remarks will probably be read with interest as bearing on this question. In a certain paper mill a plant for boiling sulphite pulp with direct steam was erected in addition to the axial indirect boilers. While formerly indirect boiling had been adopted for the preparation of easily bleached pulp, which was either bleached to make white paper or used unbleached for kraft paper, the directly boiled up was now to be used instead for the same purposes.

Although, however, the stuff so made could be bleached, it varied enormously in this respect. Sometimes it bleached easily, and sometimes only with the greatest difficulty; the cost of bleaching was greater, to say nothing of the constant uncertainty. When the directly boiled pulp was used for making tough packing-papers the paper persisted in sticking to the presses of the Fourdrinier machine, and this difficulty was only removed by making the initial grinding much finer, so that time and money were wasted in grinding and the fibre obtained was deficient in length.

Again, the paper was weaker both along and across the web than when the pulp had been boiled by indirect steam, in spite of the fact that every possible method of shaking the wires was tried. Finally, complaints from customers poured in to such an extent that a thorough investigation became necessary. It was found that in the faulty paper the cellulose had not been properly loosened, so that ligno-cellulose was present. Hence the edge-runners, formerly abandoned in favor of hollanders, had to be again resorted to, with the result the paper ceased to be too weak and to hang to the presses.

These results show that cases may occur in which the hollander, however good its construction, cannot replace the edge-runner in many cases, especially when it is supplied with direct steam.—Zentralblatt.

IMPERIAL PAPER MILLS.

The London Financier of recent date had an article on the position of the Imperial Paper Mills. Speaking of the result of negotiations of the past year, it says: "It was arranged that the pulp mill should be placed in the possession of the bank, to be operated by them for their benefit, until their claim on the company was satisfied. In the extraordinary circumstances which have arisen, this must be regarded as a beneficial arrangement for the proprietors of the Imperial. Pending any fresh arrangement, the company is in this position: The bank is running the mill and producing and selling pulp at a profit, which profit is being placed to the credit of the company, and is so reducing their overdraft. The bank is at the same time under an agreement to keep the machinery and equipment of the company's paper mill (which is not being operated) in good order. Consequently no detriment to the plant is likely to take place, unless by sheer lapse of time . . . Even as matters now stand, the paper mill of the Imperial, with certain necessary finishing strokes to its apparatus, could be run to show a handsome profit, providing labor could be obtained at current rates, and the mill was properly managed."

Referring to the appointment of two receivers for the property, our contemporary adds:

"Some of the English holders of bonds or shares appear to be perplexed by the fact that at the present time there are two receivers appointed to manage the affairs of the company—Mr. Clarkson in Canada and Mr. Tait in London. This is necessary, owing to the fact, that although it is an English company, its business is carried on in Canada. It is understood that attempts are now

being made on this side to bring about a reorganization of the company. The position of affairs at the property, though bad enough, is not exactly hopeless, and, at any rate, if it be a fact that a determined and unscrupulous attempt to wreck the company and force the property into the market—including, of course, the concessions, which are undoubtedly of immense potential value—has up to now been frustrated, the proprietors have, at least, so much consolation in their misfortunes."

THE "IDEAL" FOURDRINIER.

The Sandy Hill Iron and Brass Works, Sandy Hill, N.Y., send us a copy of their Bulletin No. 4, which describes the press part of their "Ideal" Paper-Making Machine. The chief difference between this press part and the usual type is in the construction of the press stands, which in the Ideal are each of one solid casting, and independent of the other parts of the frame. Levers and lifting arrangements being fastened to this one stand make it "self-contained." A number of advantages inhere in this design. It is necessarily of far greater rigidity, the operation of the machine in the ordinary types tending always to loosen the joints between the frame and the separate upright to which is attached the arm holding the upper press roll. The Ideal design permits of a large opening through the body of the casting for the discharge of water from save-alls under rolls, and the return of water under the machine below the felts. The disposition of this water is always troublesome in the ordinary construction, as the usually small discharge inside of the frame-work must be robbed from the space belonging to the felt, and at the same time often becomes clogged, in its inaccessible position, allowing the water to overflow on the paper. In the ordinary design of press stand the hand wheel for operating the lifting device for the top press roll is placed in such an unhandy position that it meets with the disapproval of the machine tender. Also it is usually operated by a worm gear, necessarily a slow operation. The location of the lifting wheel is entirely free of all obstruction and most easy to reach. Moreover, it is of large size and has bevel gears, which enables the operator to raise or lower the roll instantly and without any bother when necessary.

LEAVE OUR HANDS FREE.

Referring to the investigation at Washington into the pulp and paper industries of the United States, the Ottawa Journal speaks thus of the proper attitude which should be adopted by Canada: "The Canadian Federal and Provincial Governments hold the winning cards. The people of Canada will expect them to enter into no bargain with Washington that will in the slightest degree tie their hands in establishing such regulations as will make it more profitable henceforth to manufacture pulp and paper in Canada to the benefit of Canadian labor and other interests, than to transport it across the line to continue the building up of United States industries at our expense."

SATINISED PAPER.

A glossy surface is a great recommendation for many kinds of paper, and all sorts of paper, whether the material is rags or mechanical pulp, acquire by calendering not only a good appearance, but good handle and good sizing properties. It is only properly made papers that can be satinised. If the web leaves the machine with an ununiform texture satinising will not compensate for the defective manufacture. Such badly made papers often become creased in calendering, and the difficulty is thereby greatly increased.

In the paper machine the chief difficulty arises from want of uniformity in the removal of the water, whether by draining or by the use of suction-boxes. As regards the pulp the composition and

the grinding are of much importance. If the fibre is ground too short, the paper will be less able to resist the pressure of the calender rolls. Even if it stands the pressure and tension of calendering, it becomes transparent and dark in color by reflected light. Only coarsely ground stuff will give a color capable of receiving a good handle and a good satinisation. At the same time, it is easier to size a paper made from coarse than from fine ground fibre.

When the paper has left the machine and has been rolled up, it is well known that it keeps warm for a considerable time. If it is calendered while still warm, the water previously sprinkled on it causes water stains. After damping the paper should be kept for at least twenty-four hours in a cool place before calendering. If this time can be increased, so much the better. Experience has shown that the longer the time the less calendering is necessary. The highest lustre is obtained by repeated calenderings, the pressure and heat of the calender rolls being increased at each passage.—Papier Fabrikant.

EXTRACTION OF BLEACHING POWDER.

A writer in the Papierfabrikant has made an interesting study of the rate at which water will extract the last traces of hypochlorite from bleaching powder residues. It is granted that plant is obtainable which enables the bleaching powder to be extracted down to a mere trace, but such arrangements are costly and complicated, and are only suited for mills in which very large quantities of bleach are used. The usual equipment of a mill of moderate size consists of a simple mixing tank in which the bleaching powder is either ground or merely stirred up with water. In such mills the bleach extraction plant is often worked to its utmost, and when the strong liquor is wanted at once, the partially exhausted mud is thrown away when it still contains appreciable quantities of chlorine. The writer has seen waste mud containing, in extreme cases, as much as 7 to 12 per cent. of chlorine, equal to about one-quarter of the chlorine originally present in the powder.

His studies have shown that bleach mud, poor in chlorine, is most efficiently extracted by an upward stream of water and that the economy is more complete the slower the passage of the water. He therefore proposes a simple arrangement which can be fitted up in any mill and which enables the waste mud from the bleach mixing tanks to be utilized to the utmost extent. The arrangement consists of a tall, vertical wooden box; about one foot from the bottom of a false floor, made of wooden bars covered with a copper wire sieve, is fixed to the sides of the box. The box may have a capacity of about 220 gallons, which is large enough for a daily consumption of 5 cwt. of bleaching powder; the taller and narrower the box the better. The mud from the mixing tank is tipped into the box and rests on the wire floor. Below this floor is the inlet pipe for the extraction water, whilst the outlet is situated at a conveniently high level in the side of the box. The inlet pipe may be made of any material, but the outer pipe should be made of lead. The current of water is regulated by means of a cock in the inlet pipe so as to flow as slowly as possible. The water passes upwards through the mud and extracts the chlorine, flowing away through the outlet either perfectly or nearly clear. This water is used next day for dissolving fresh bleaching powder in the mixing tanks

One of these arrangements will effect considerable economies in small mills, but if a still greater efficiency be desired, two or three may be arranged in series, connected together by pipes and cocks in such a way that the water issuing from the box containing the poorest mud can be turned into a box containing a richer mud, on the well-known principle of a diffusion battery. A man-hole door situated just above the wire bottom serves for discharging the mud after all the bleach has been extracted.

POSITION WANTED.

Superintendent open for Engagement.

A1 on Book, Bond, Blottings and Coating Stock 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc. Address M. R. J. care Pulp and Paper Magazine, Toronto.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

FOR SALE

One second hand revolving rag boiler, in first-class condition, driving gear and all complete, Dimensions: 6 feet diameter by 25 feet long, with 2 doors, working pressure 50 pounds per square inch. For price and further particulars apply to the Cornwall Paper Manufacturing Company, Mille Roches, Ont.

WANTED

After April 1st, (by a Swedish gentleman, at present in this country,) position as superintendent or designer of sulphite pulp or wood pulp paper mills. Large experience abroad as well as in this country. Highest testimonials for economical constructions. The advertiser is an originator in his line, especially in the chemical side of the sulphite industry. Consumption of sulphur in last sulphite mill built 8% **Brown** mech. pulp, a specialty. Address

C. E. B., P. O. Box 161,
Chicoutimi, Que., Canada

Position Wanted

Englishman with family, desirous of settling in Canada, would make a change, and invites correspondence from parties needing Foreman Papermaker. Have had 8½ years as Night Superintendent and 6½ years as Day Superintendent, in one of the most successful large Pulp and Paper Mills, making best sulphite papers, mill making 31% profit and paying 20% dividend. Exceptional good references from other successful mills. Address

"DESIRABLE"
Care of PULP & PAPER MAGAZINE

THE MARKETS.

Toronto, June 13, 1908.

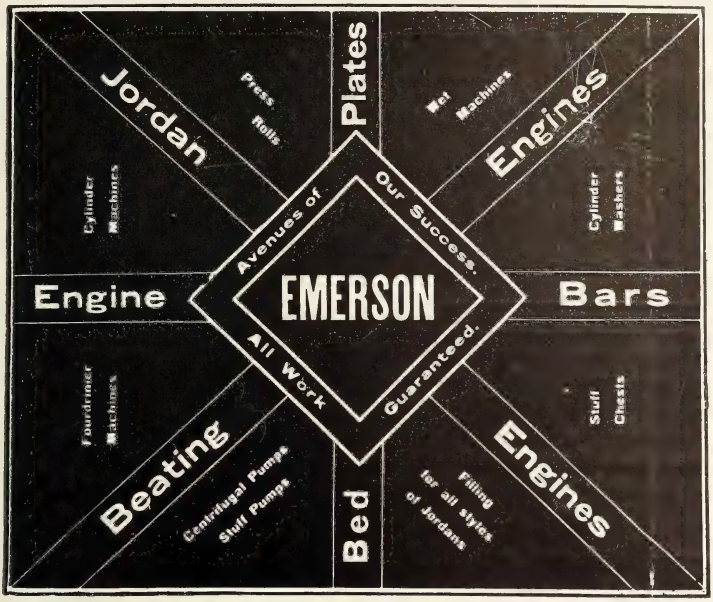
With the advancing season and the increasing feeling that crops are sure to prove bountiful throughout the Dominion, business in the paper and other trades is improving. For immediate requirements the demand may be almost called brisk. Prices are steady, though there have been some cases of cutting heard of. There seems to be at present, writing, however, less tendency towards this. The pulp market continues quiet, but a few more enquiries have been coming in from the United States. Dealers in Canada believe they will have to come on the market in earnest very shortly. Meantime, while demand is slack, holders of pulp do not like to let go at reduced prices, so that it would be of little use to make quotations.

British.—According to the World's Paper Trade Review, there is an absence of demand for Mechanical Wood Pulps. Norwegian advices report that manufacturers maintain a very firm attitude. Buyers, on the other hand, are holding off from placing orders in the hope that prices will fall more in line with their views. The general quotation for forward delivery is 47s. 6d. to 50s. There is a growing belief that prices will fall considerably later on. The best brands of Easy Bleaching Sulphite keep firm, while for "news" or strong quality an easier feeling has shown itself of late. Soda pulps are depressed, prices being continually weakened owing to the production of new mills coming on the market. For chemicals there is a moderate demand at steady prices.

—The article in last issue on "First Principles in the Manufacture of Kraft Paper," by J. A. DeCew, of Montreal, attracted considerable attention. It contains one or two points with which some people may not fully agree. If so, we would be glad to take up the matter in fuller detail, so that criticisms may be answered by the author.

—The best gear wheels have been shown by the tests of a British firm to be those made from a high-grade manila paper. They are formed in a 100-ton hydraulic presses, are stronger and more elastic than cast-iron, lighter than rawhide, noiseless, almost frictionless and without perceptible vibration.

EMERSON MFG. CO.



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THE UNITED WIRE WORKS LTD.

Edinburgh, Glasgow & Newcastle on Tyne.

FOURDRINIER WIRES

CYLINDER WIRES

Wire Cloth all meshes, in Brass, Copper Bronze & Steel.

SOLE AGENTS FOR CANADA

ARTHUR P. TIPPET & CO., 8 Place Royale, MONTREAL.

Wires held in stock at Montreal for prompt delivery.

PANZL'S PATENTED LINING COMPOSITION

IS THE SAFEST AND BEST MATERIAL FOR

LINING OF SULPHITE PULP DIGESTERS

AND ACID RECLAIMING TANKS

PANZL LININGS ARE SAFEST AND MOST DURABLE

They are really acid-proof and practically indestructible.

All Digesters lined with Panzl's patented composition, now as tight and in as good condition after years of continuous use as they ever were, no leaks and no repairs.

Panzl Linings can be made considerably thinner than the other linings, thus increasing the capacity of the digesters.

The composition and the system of constructing of Panzl Linings are patented in al countries where wood pulp is being manufactured by the sulphite process. The PANZL U.S. Patents have been adjudicated to be valid in law and wholly independent of all prior patents relating to linings of digesters.

For information and estimates, address

PANZL DIGESTER LINING COMPANY

28 Nassau Street, NEW YORK, N.Y.

ESTABLISHED 1804

J. J. MARX

LAMBRECHT (Palatinate) GERMANY

High Class

FELTS

Jackets and all Kinds of Woolen and Cotton Dry Felts for Pulp and Paper Mills

AGENTS FOR THE DOMINION OF CANADA

HUPFELD, LUDEKING & CO.,

P.O. Box 559, MONTREAL

To Owners of Pulp Mills

Newspaper publishers using 151,000 tons of news print paper per annum have authorized the undersigned to negotiate for them with owners of pulp mills and arrange for the installation of machines with the understanding that if a satisfactory basis can be reached, the publishers will underwrite and guarantee a price, f.o b. mill, which the mill owners will receive for a term of years on the news print product of new paper making installations to be operated within one year from date. By underwriting is meant that the publishers will guarantee that they will take the entire output of the new machines for 312 days of each year at a minimum price to be now fixed in case the mill owner is not able to sell, at time of manufacture, his product elsewhere at a higher price. The minimum price will apply to purchasers of the latest news print paper machines with extras as follows :

For widths that do not entirely cover the machine.
For weights that are less than the accepted standard.
For orders that involve changes or delays in runs.
For other conditions that reduce output or increase cost.
Cash f. o. b. mill gross weight.

Those to whom this proposition appeals should address

JOHN NORRIS,
Chairman of Committee on Paper,
American Newspaper Publishers' Association,
Pulitzer Building,
NEW YORK.

New York, June 12, 1908.

Judicial Sale of Paper Mill

Pursuant to an order of the High Court of Justice made by his Honor J. R. O'Reilly, Local Master of the High Court of Justice at Cornwall, in the matter of the Winding-up Act and of Cornwall Paper Manufacturing Company, Limited, sealed tenders will be received addressed to the said Local Master at his office, Court House, Cornwall, Canada, and marked " Tender re Cornwall Paper Manufacturing Company, Limited," up to ten o'clock in the forenoon, on the 22nd day of June, 1908, for the purchase of the real estates, buildings, machinery and equipment of the Cornwall Paper Manufacturing Company, Limited, situated at Mille Roches, Ontario, Canada, about six miles west of Cornwall and about seventy-two miles west of Montreal. The Mill was erected in 1904 and the buildings, plant and machinery were of the latest design.

The Mill is in operation under the control of the Liquidators of the Company, and is running at its full capacity, and satisfactory orders are being secured by the Liquidators. Descriptive circulars can be had on application to the Trusts and Guarantee Company, 45 King Street, W. Toronto, Ont., or John C. Harkness, Esq., Cornwall, Ont., or Charles W. Kerr, Barrister, etc., 48 King Street, W. Toronto, Ont., giving full particulars of property, terms of sale, character of tenders required, etc.

Dated at Cornwall this 28th day of May, A.D. 1908.

(Signed) JAS. R. O'REILLY,
Local Master at Cornwall.

Moreau Pulpwood and Log Barker

BUILT EXPRESSLY TO PEEL PULPWOOD

Capacity — three cords per hour with one man and six horse power.

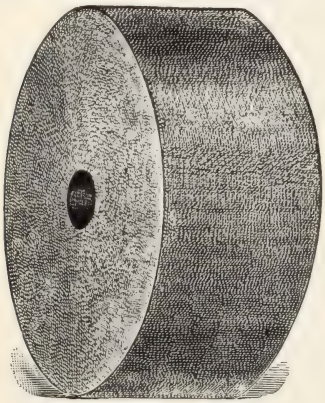
Diminution of wood by barking 16 to 18 per cent. according to size and quality of wood.

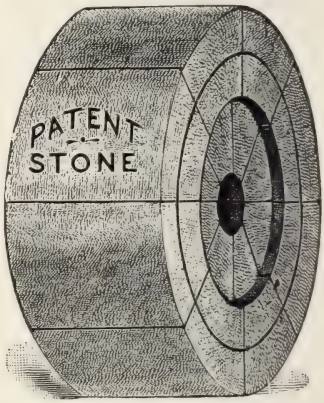
Peels wood of all dimensions, 3 inches up and of all lengths from 36 inches up.

The most desirable certificates and full particulars on application to

The Moreau Barking Machine Co., Ltd.
ST. HYACINTHE, - Que.
WILLIAMS-GRAY CO'Y CHICAGO, Ill., Manufacturers and Sole Agents for United States

PULP STONES
ENGLISH, GERMAN and SCANDINAVIAN
ALSO THE
PATENT UNIVERSAL





the construction of which gives to it advantages not found in the one piece stone.

Let us tell you about them

JEAN FREESE
132 NASSAU ST., NEW YORK, U.S.A.

GROUND WOOD
SULPHITE
PAPER STOCK

G. A. HOWELL,
1305 Traders Bank Bldg.
TORONTO, Canada.

Riordon Paper Mills, Ltd.

MARK FISHER BUILDING, MONTREAL, CAN.

Makers of strong fine qualities of unbleached spruce sulphite fibre, news, hanging, and all grades of building and sheathing papers.

The Largest Manufacturer of Sulphite Pulp in the Empire.

THE CANADA COATING MILLS, Ltd.

GEORGETOWN, ONT.

..Manufacturers of..

Surface Coated Book and Lithographic Papers, Coated Cardboards and Coated Boxboards of every description.

St. John Pulp and Paper Company,

MISPEC, N.B.

Highest grade Sulphite for Book, Ledger and Writings,
Quality equal to best imported Norwegian Stock.

Address all communications to the Managers,

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HAMBURG 36.....Neuerwall 42
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Mechanical and Chemical Pulp of all kinds.

Sole Agent for U.S.A. and Canada of

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Finest Bleached and Unbleached Sulphite Pulps.

Cable Address,—"Kaolin, Manchester." A.B.C. Codes, 4th & 5th Editions

CHINA CLAY CO.

JOHN WILLIAMSON, Manager.

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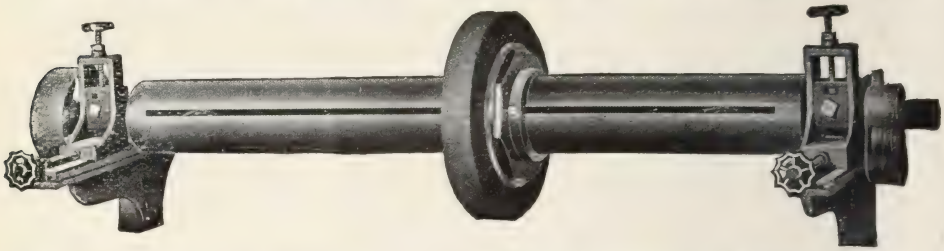
MINES—Ruddle, Bojea, Colchester, South Nimestones, Tronance, St. Austell, Cornwall.

CONTRACTORS TO H.M. INDIAN GOVERNMENT

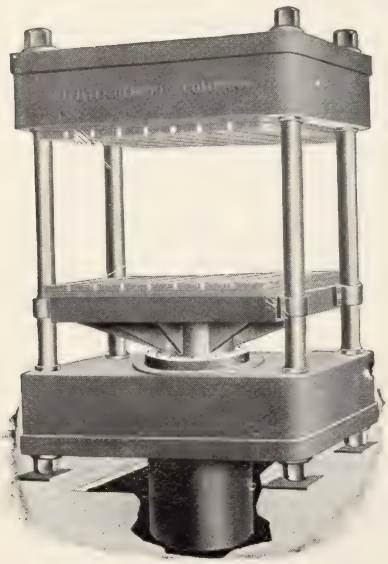
Canadian Representatives—C. A. Meincke & Co., 222 Coristine Bldg., Montreal.

'The Roy Patent Calender Roll Grinder"



B. S. ROY & SON, - Worcester, Mass. U.S.A

PRESSES, HYDRAULIC or KNUCKLE JOINT



Heavy Duty Pulp and Baling Presses.

WILLIAM R. PERRIN & COMPANY, Limited,
TORONTO, Canada.

PULP WOOD SAWING MACHINE

Cuts 500 twelve foot logs per hour into two foot lengths ready for the barker. Operates automatically and only one man required to take charge of it. The most economical machine known for pulp mills and rossing plants. Full particulars and illustrations gladly sent.

PERRON GAGNON & CO.,
Chicoutimi, - - Quebec.

THOS. GAIN AND SON, Manufacturers Agents,
Staples and Specialties in Paper Goods

We have good connections, and are prepared to handle any real good lines. Goods received on consignment for sale in this market. Can give High Class reference.

Office and Warehouse 124 Richmond St. West, Toronto.

E. PULLAN, 490 Adelaide St. W., TORONTO.
Largest Paper Stock Dealer in Canada
RAGS AND PAPER STOCK GRADED TO SUIT MILL REQUIREMENTS
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THE UNION SULPHUR COMPANY

PRODUCERS OF THE HIGHEST GRADE BRIMSTONE ON THE MARKET.

AVERAGE ANALYSIS: { Sulphur, . . . 99.9 per cent.
Organic matter, .1 per cent.

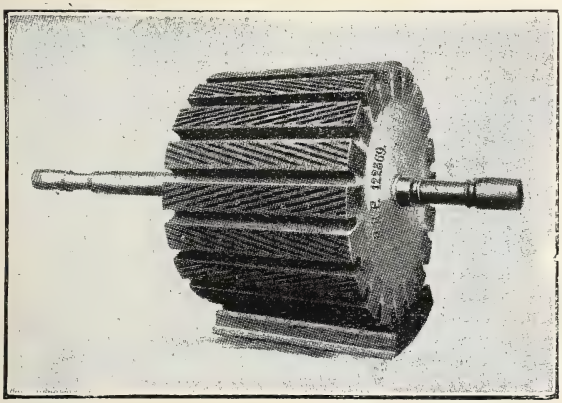
Absolutely free from Arsenic, Selenium or Tellurium.

The Largest Sulphur Mine in the World.

CALCASIEU PARISH, - LOUISIANA.

Main Offices, - - - - - 82 Beaver Street, New York.

PATENT SCHMIDT'S
Stone Beater Rolls and Bedplates



The Beater Rolls are fitted with Basalt Lava Segments in place of Metal Bars and Knives.

Suitable for all Systems of Beaters.

Over 300 Rolls actually at work, partly during 5 years.

Many Repeat Orders from British and Continental Mills.

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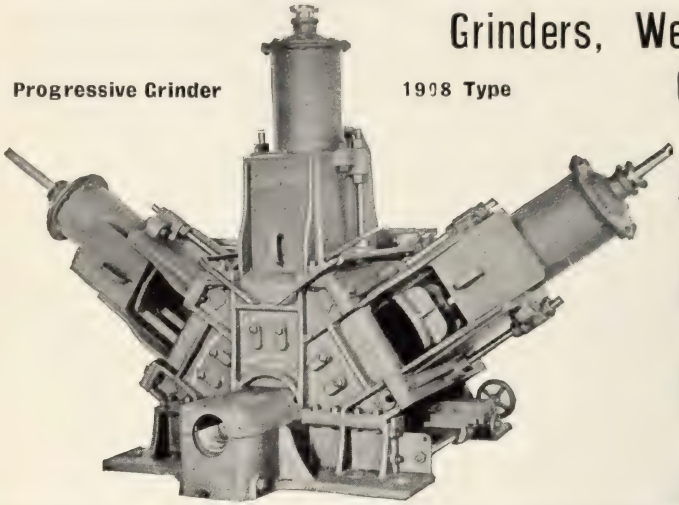

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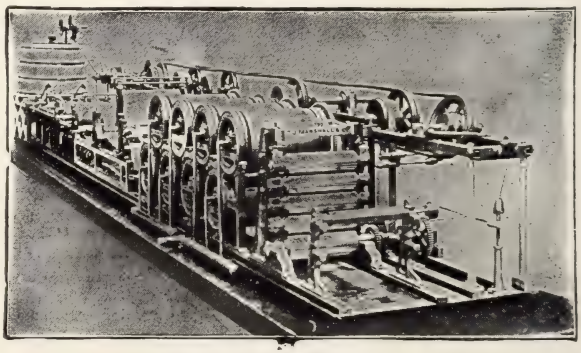

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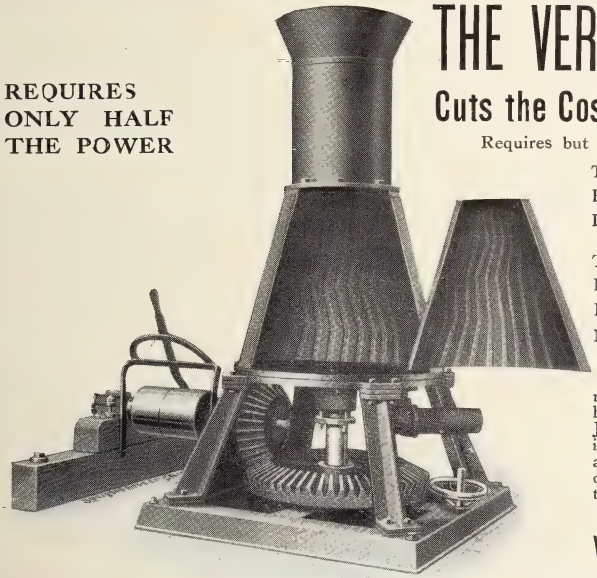

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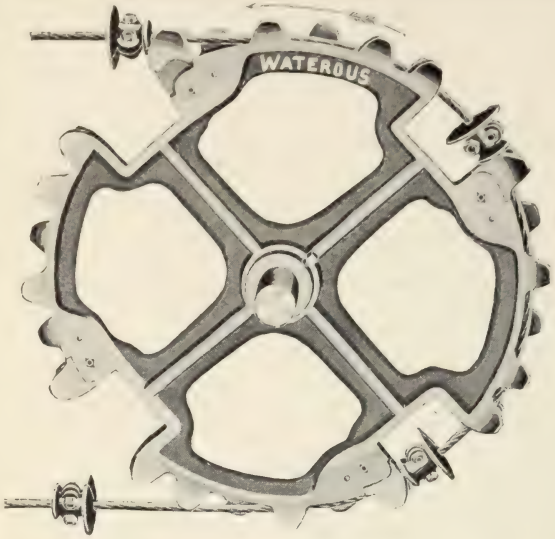

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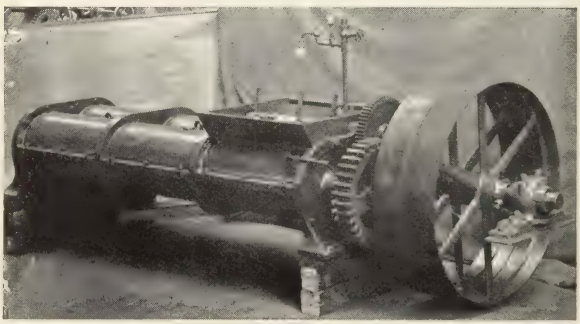

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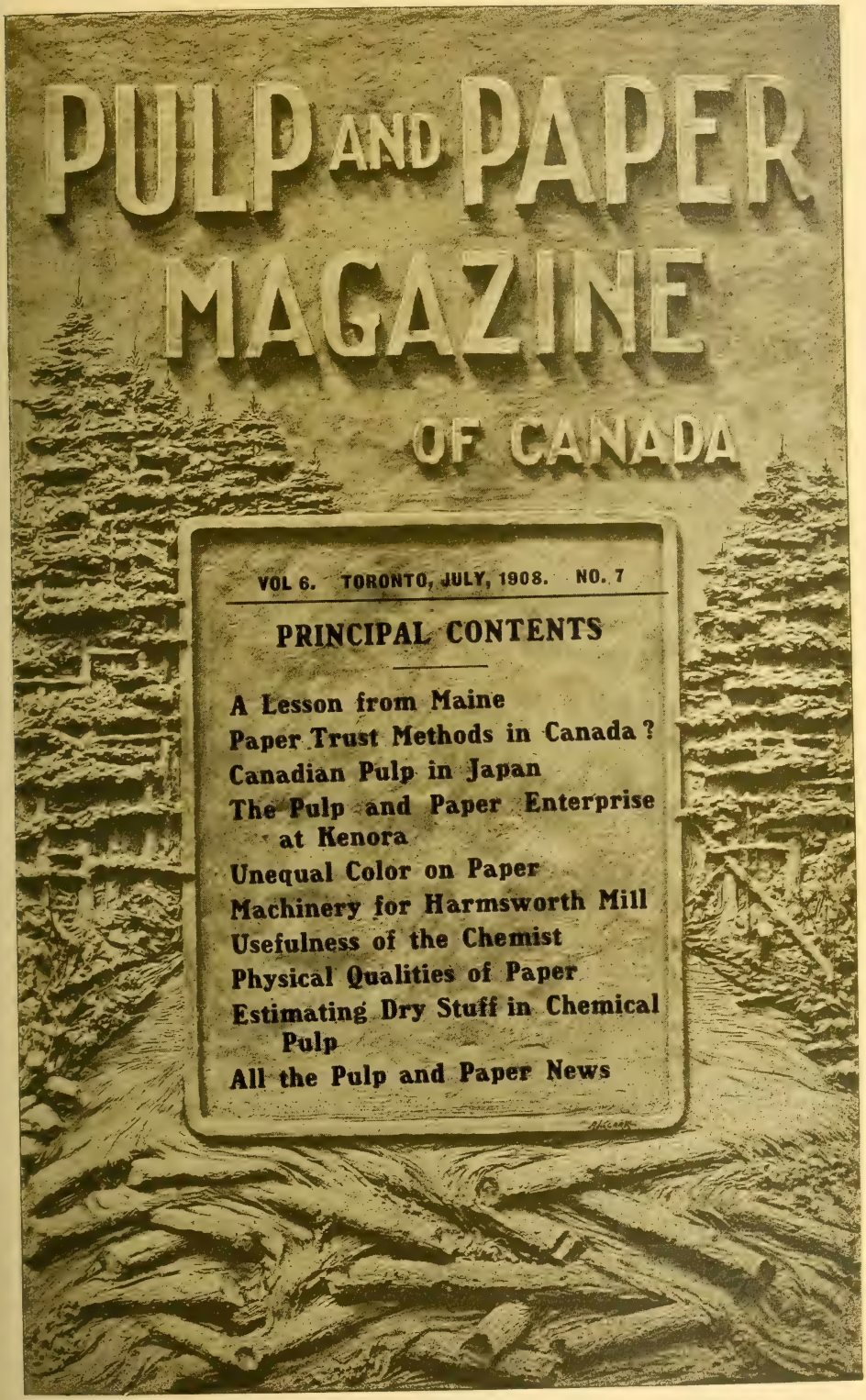
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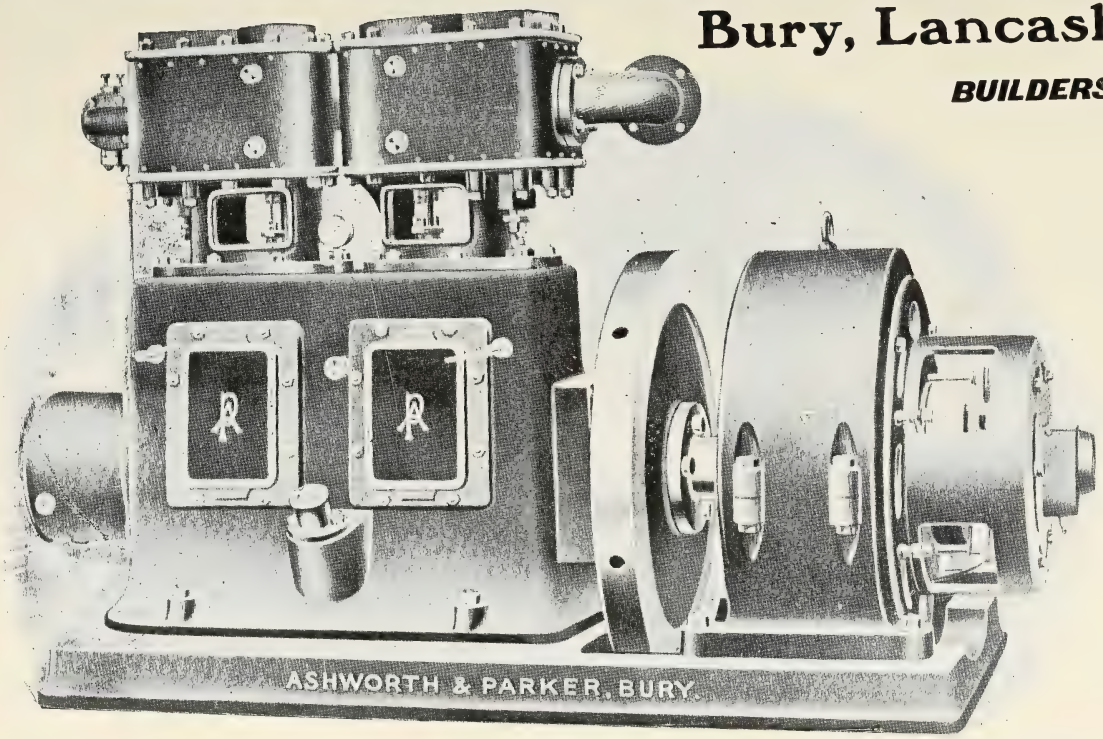

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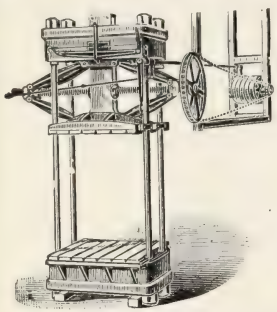

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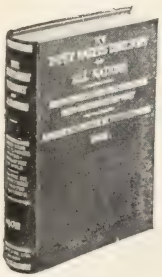

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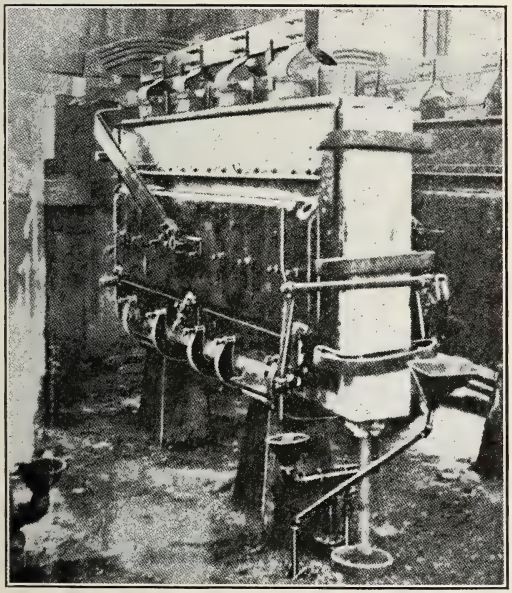

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Send us your plans or ask for Representative to call on you

THE M. GARLAND CO.

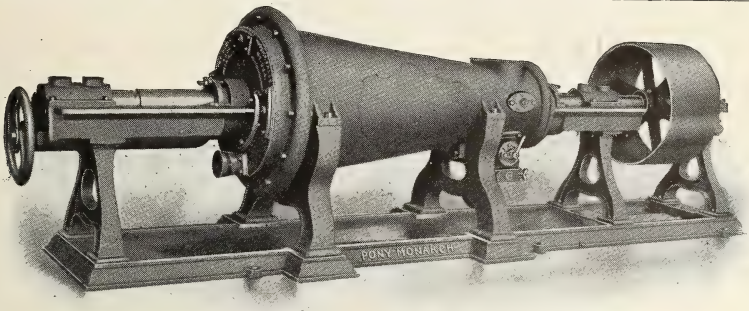
Manufacturers of CONVEYING, SAW MILL and WOOD DESTRUCTIVE MACHINERY

BAY CITY MICHIGAN U.S.A.

The Noble & Wood Machine Co.

HOOSICK FALLS - - - N. Y. - - - U. S. A.

PAPER & PULP MILL MACHINERY.



THIS IS OUR SMALLEST SIZE JORDAN—10 TONS.

JORDAN ENGINES - - - 4 SIZES - - - 10-24-30 & 40 TONS CAPACITY.

BEATING ENGINES	BINDERS' BOARD MACHINES	LEATHER BOARD MACHINES
RAG CUTTERS	STUFF CHESTS	FAN DUSTERS
STUFF & FAN PUMPS	PIN DUSTERS	R R DUSTERS
FLY BARS	BED PLATES	THRASHERS

FAWCETT PRESTON & CO., Limited, Engineers

Phoenix Foundry, 17 York St., LIVERPOOL, England

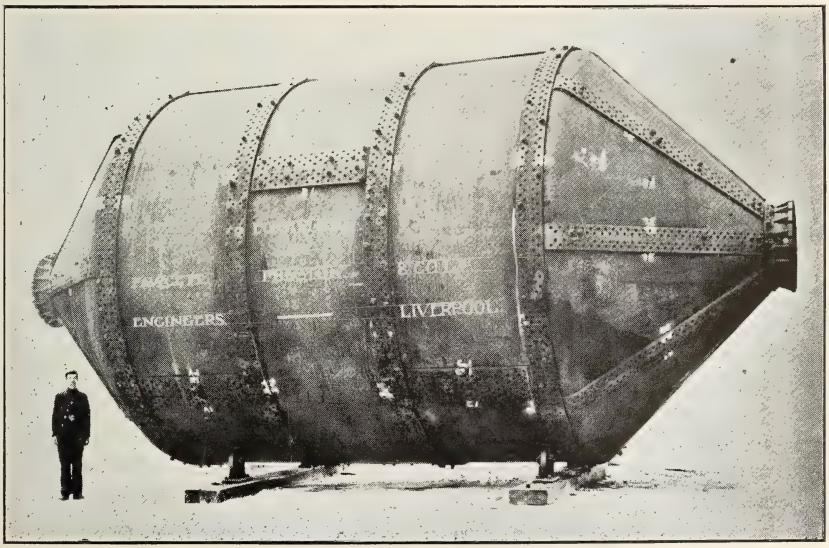


Photo shows Digester 17 ft. 6 in. diam. x 36 ft. 8 in long supplied to **Edward Partington Pulp & Paper Co., St. John, N.B.**, being the fourth digester supplied by us to this mill. Write for circulars and price.

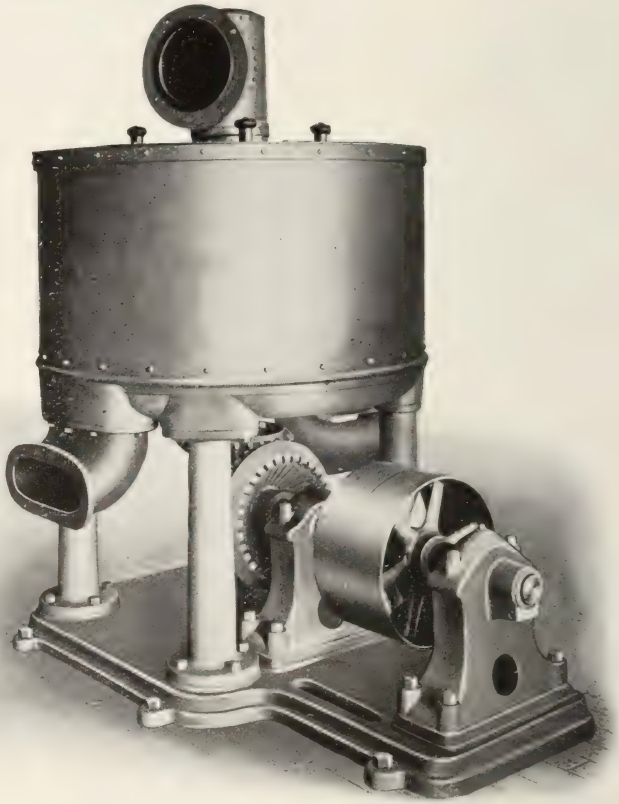
The Ruth Centrifugal Pulp Screen

The Only Self-Cleaning Pulp Screen in the Market

The Screen Plate is so arranged that it **positively cannot clog.**

They require practically no attention, very little space and operate with a minimum of power.

The most **Durable, Accessible, Economical and Practical** Screen on the market to-day.



Screens are installed free of all charges for thirty days' trial, and **we have never had a Screen returned from any trial.** One week's work of this Screen will convince you of its merits. All we ask is a fair trial.

Over sixty in use in the largest pulp and paper mills in the United States.

Write for full particulars to

Contractor's & Pulp Mill Machinery Co.

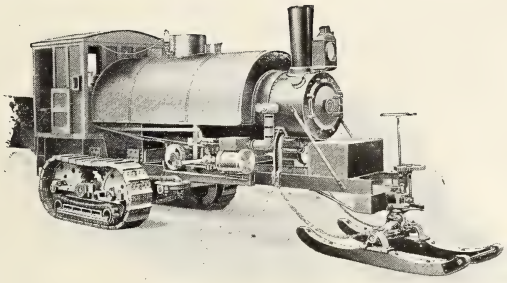
THOROLD, ONTARIO

SOLE MANUFACTURERS FOR CANADA.

THE

LOMBARD STEAM LOG HAULER

Dominion of Canada Patent, No. 108,676



A FEW FACTS

They are perfectly adapted to Lumbering conditions in Eastern Canada and are the only successful and satisfactory Log Haulers on the market.

They will travel at the rate of 5 miles per hour with a train of from 50 to 100 thousand feet of lumber, depending on the condition of the road.

Only 3 men required to operate and they burn only $1\frac{1}{4}$ tons of coal in 10 hours.

They will also burn wood and will work 20 hours per day if required.

Each machine does the work of about 20 teams and from 15 to 18 fewer men are required.

When the Log Hauler is not in use the expense practically ceases. Compare with men and horses.

Circular giving full particulars will be sent to any address on request.

BUILT BY

THE

Jenckes Machine Company

LIMITED

General Offices: Sherbrooke, Que.

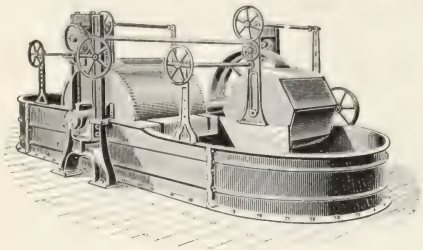
Plants: Sherbrooke, Que, St. Catharines, Ont.

Sales Offices: Sherbrooke, St. Catharines, Rossland, Vancouver, Halifax, Cobalt.

HOLYOKE MACHINE COMPANY

HOLYOKE, MASS., U.S.A.

MANUFACTURERS OF



Machinery for Wood Pulp and Paper Mills.

Vertical and Horizontal Water Wheels with Flumes and all connections.

Wood Barkers, Wood Chippers and Wet Machines.

Washing and Beating Engines with Patent Double Hoist and Tubs of either wood or iron.

Hydraulic Pumps and Presses.

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Newest Designs

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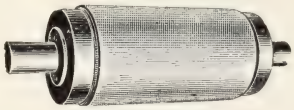
Highest Efficiency

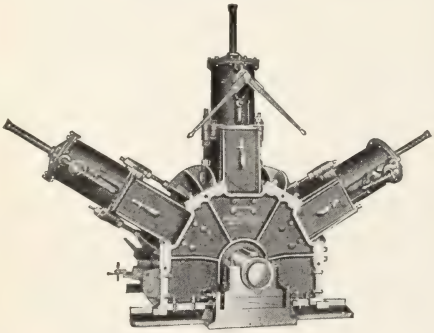


Cotton and Paper Rolls with Patent Fastenings.

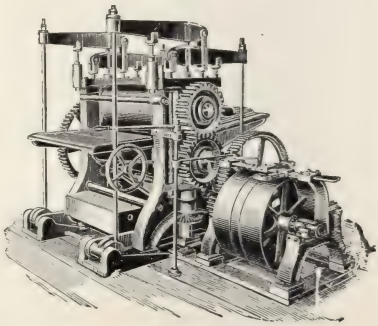
Calenders. All kinds of Super-Calenders, Friction Calenders and Platers.

Chilled Iron Rolls.

Special Machinery.



Patent Improved Wood Pulp Grinder.

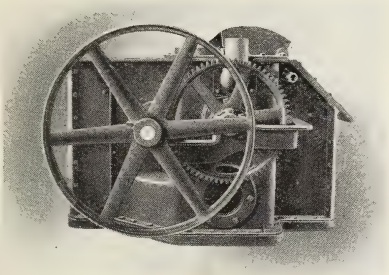


Elevators, Rotary Fire Pumps and Friction Gearing.

Gears Accurately Spaced and Planed.

Shafting, Pulleys and Mill Work.

Description and Estimates Furnished; also Gear List and Catalogs sent on application.



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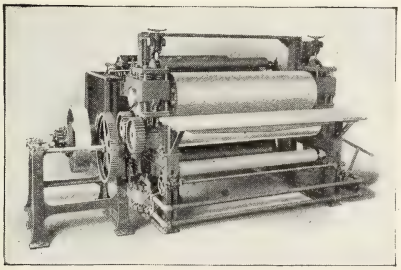
Let us quote prices on any new machinery that you are planning to instal. We build complete from your specifications or supply our own patented types of machines.

WE BUILD

Deckers, Wet Machines, Rolls, Cylinder Moulds and General Machinery

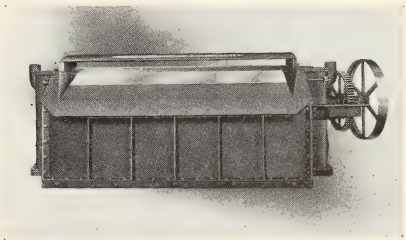
Also Execute Special Work and Repairs



Our patented Pneumatic Save-All, operating on an entirely new principle, without couch roll saves from 75 per cent. to 90 per cent. of waste fibre, even in cases where other types of save-all fail absolutely. Let us prove this to you. This machine is controlled solely by us in Canada. It is widely used among prominent mills. Send for names of users.

SHERBROOKE MACHINERY CO.,
LIMITED
SHERBROOKE, P.Q.

We controlt he sole rights in Canada for the Standard Pa per *N* achinery made in the U.S. by the I mproved Paper Machinery Co.



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BENNINGTON, VT., U.S.A.

Manufacturer of best up-to-date

PULP MILL MACHINERY

including the

NEW ENGLAND WOOD PULP GRINDER, SCREENS, WET MACHINES, SAWING MACHINES, BARKERS, SPLITTERS and CONVEYORS.

Can furnish plans for mills, also furnish complete outfit of machinery including shafting and gearing, and can name price for the complete outfit for a mill, with full guaranty for the production of the mill and the integrity of the machinery, and give ample opportunity to test the machinery under the guaranty before paid for.

The 1906 pattern of pulp grinder was sold last year to make 6 tons daily of fine pulp, and when tested under the warranty made considerably more. The pulp machinery made at this establishment includes about 600 pulp grinders used in 143 mills scattered through the United States, with 21 mills in Canada and Newfoundland, also in Mexico, Japan, Sweden, Norway, Germany, and one mill for the Emperor of Russia. Have machines on hand for prompt delivery, and can furnish machinery at reasonable prices.

Can give liberal terms of payment to responsible parties.

No charge for specifications and reliable estimates for cost of mills.

ARE YOU SURE

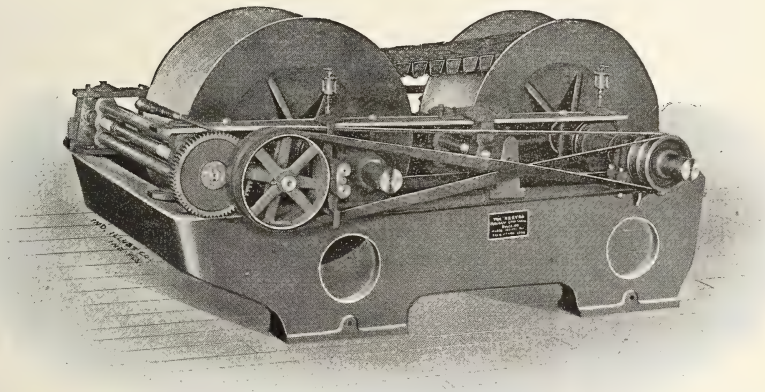
That you are manufacturing at the least possible cost ?

IF YOU HAVEN'T YOUR MACHINERY EQUIPPED WITH

"The REEVES"

Variable Speed Transmission

WE **KNOW** YOU ARE NOT—
LET US PROVE IT



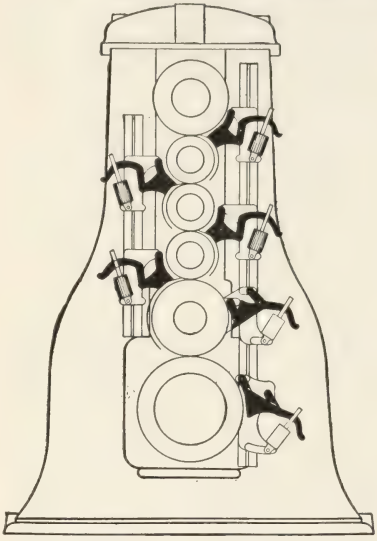
REEVES PULLEY COMPANY,

COLUMBUS, INDIANA, U.S.A.

DILLON MACHINE CO.

BUILDERS OF

PAPER MILL MACHINERY

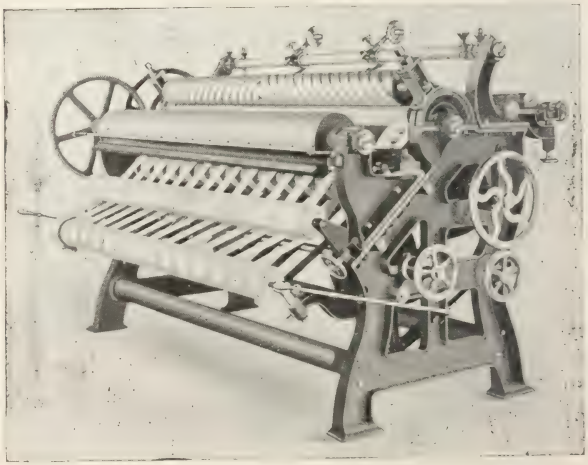


DILLON DOCTORS AND FEEDS

DILLON MACHINE CO. LAWRENCE MASS.

- Beating Engines
- Washing Engines
- Jordan's Three Sizes—Single, Double & Triple
- Stuff Pumps, with Dillon Patent Valve Seating
- Wet Machines
- Horizontal and Vertical Stuff Chests
- Single and Double Paper Cutters
- Backstands
- Plates, Knives and Bars

DILLON PATENT DOCTORS AND FEEDS MADE IN CANADA BY THE SHERBROOKE IRON WORKS, SHERBROOKE, P.Q.



LAWRENCE, MASS., U.S.A.

Have You Heard

The Facts About

THE BELOIT MACHINES?

One Fourdrinier built for 500 feet has run 615 feet, and averages 550 feet and makes 72,000 lbs. of print in 23 hours.

Another, built for 350 feet for manillas, is running 490 feet every day on print.

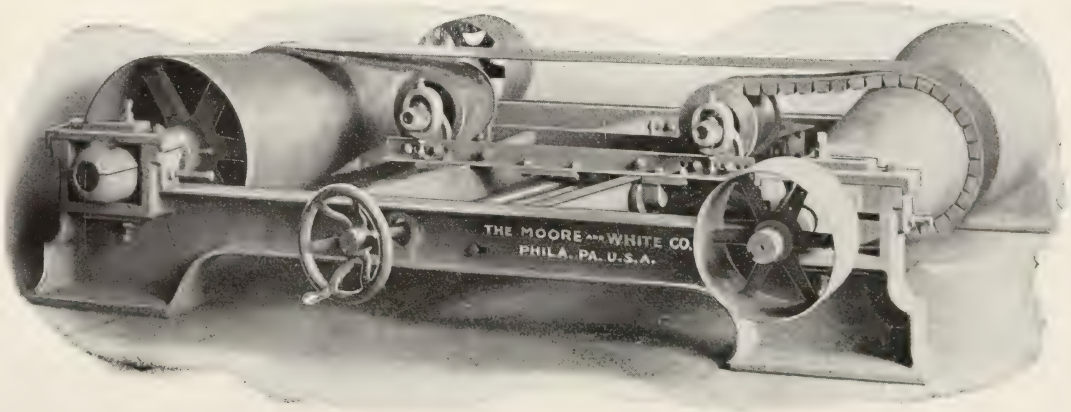
Two others, built for 250 feet on book, are now speeded up to 340 feet on book.

A cylinder machine built for 40 tons of strawboard has made 60 tons in 23 hours.

BELOIT IRON WORKS

BELOIT, WIS., U.S.A.

"Moore & White" SPEED CHANGE for Paper Machines.



WIDE BELT. PERFECT CONTACT.

ANY DESIRED RATIO OF CHANGE.

Absolutely No End Thrust or Tendency Sidewise of Transformers or Driving Belt.

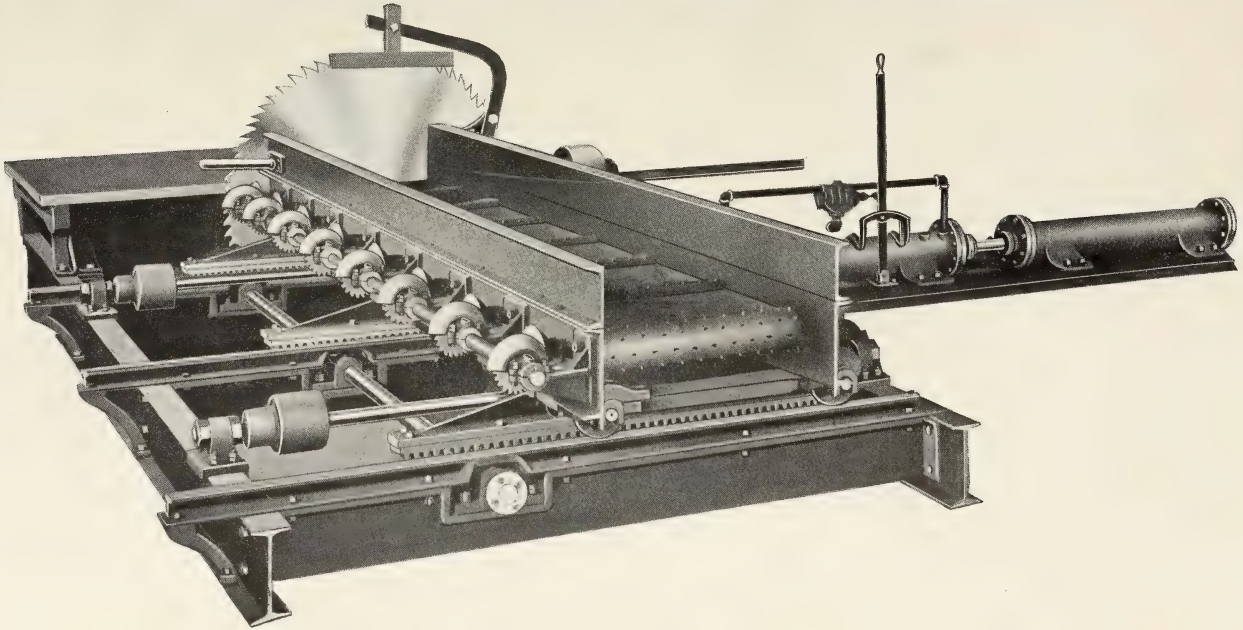
The Moore & White Co.

PHILADELPHIA, U. S. A.

BUILDERS OF PAPER MAKING MACHINERY

STEAM, FEED, PULPWOOD CUT-OFF SAW

SUPERIOR TO ALL OTHERS



CAPACITY 125 CORDS 10 HOURS

FLOOR SPACE, 21 FT. X 9 FT. WEIGHT, 16,000 LBS.

BUILT BY

VALLEY IRON WORKS CO.,

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127 BOARD OF TRADE BLDG., MONTREAL.

Agents for the United Alkali Co. of England

OFFER TO THE TRADE:

Caustic Soda 60° to 78° Soda Ash, Caustic Potash, Sal Soda, Silicate of Soda, China Clay, Rosin size and a full line of Rosins, direct shipment from the south.

Contracts made for regular supplies. F

TUCK'S

"TUCKSONA" BALATA BELTING

THOROUGHLY WATERPROOF

SUITABLE FOR ALL KINDS OF

Engineering Work - Pulp and Paper Mills, etc.
Electric Lighting - Brick-Making
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EVERY BELT GUARANTEED. Stock 1 in. to 15 in. in Montreal.

A. HAWKSWORTH & SONS CO., Ltd., 551 St. James St., MONTREAL.

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WILL INCREASE YOUR CHIPS
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By virtue of its Design and its Patent Feed Spout takes a Minimum Amount of Power

Ask Port Edwards Fibre Co.
Ask International Paper Co.
Ask P. H. Glatfelter Co.

OR WRITE

CARTHAGE MACHINE CO.

CARTHAGE, N.Y.

THE
PULP AND PAPER MAGAZINE OF CANADA

Vol. 6.—No. 7. TORONTO, JULY, 1908. $1 A YEAR. SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

BIGGAR-WILSON, Ltd.,

PUBLISHERS

OFFICES, CONFEDERATION LIFE BUILDING,

TORONTO, CANADA.

A LESSON FROM MAINE.

Maine is par excellence the spruce State of the Union. On the production of that region Americans depend for their supply of pulp-wood more than on anywhere else within their own borders. The State Forester claims that Maine contains one-third of the whole spruce area of the United States. He estimates that the stand of spruce in that State is about 21,250,000,000 feet and the annual increase about 700,000,000 feet, though a good many leading lumbermen believe this estimate of increase to be considerably too high. He also estimates that no less than 800,000,000 feet are used annually, being about equally divided between lumbering and paper-making. At this rate it is clear that at least 100,000,000 feet a year are being taken out of the forest capital of the State. Not only this, but the annual cut represents the production of the best and most easily accessible districts, while every year increases the cost, owing to the lumbermen having to go further back. This, in combination with the fact that the demand is ever growing, is causing serious alarm as to the continuance of the supply of pulp-wood, even in favored Maine. In fact, steps are being taken to restrict the annual cut of lumber, though a difficulty presents itself in the fact that most of the timber lands are held by private parties.

Another indication of the seriousness of the situation in Maine is the large and increasing quantity of pulp-wood sent there from the Province of Quebec. In 1905, about 28,000 cords were sent; in 1906, about 97,000 cords, and now it is estimated that as much as 225,000 cords go into that State for use in the pulp and paper mills every year from Canada. Without a supply of pulp-wood from Canada, the forests of Maine would last but a short time. At any rate, instead of being able to look to that State for a way to escape the inevitable results of past prodigality, the American pulp and paper mills are seeing repeated the experience of the once productive States of New York and New Hampshire.

CANADIAN PULP IN JAPAN.

Alex. MacLean, Canadian Trade Agent in Yokohama, Japan, states in a report that there has been a good deal of correspondence, with the view of inducing the export of wood pulp from Canada to Japan, without much result. Sulphite pulp is imported quite largely. But so far, he says, Canadian manufacturers have not indicated preparations to compete. The principal importation is of northern European production, coming mainly through German export avenues. The most recent concrete case is now pending, being under consideration and offer to the trade by a prominent trading company in that country. With an ample display of samples laid out upon a table, it was admitted that in color and texture, and as to every point of quality, the Canadian article was superior, and the hope was expressed that high quality might meet with some demand. But the prices figured out to the customs at Yokohama at 130 yen a ton up for Canadian to 104 yen a ton for the European. The quality, it was thought, might balance this difference in price to some small extent, but there was no hope of the demand, if any, approaching high figures. The inference from correspondence is, that the Canadian article is of one uniformly good quality and high price, and that there is, therefore, at present little prospect of pulp export to Japan. There is no market for ground pulp, comparatively large quantities of that article being made in Japan of a quality suitable for the requirements of the paper mills.

He adds that a corresponding firm in British Columbia states, with reference to an inquiry about pulp, that no business has resulted, they thought, because the agent of the Japanese inquiring firm had doubtless been able to make arrangements direct with manufacturers elsewhere. The prospect of future trade between Canada and Japan, sketched from the point of view of the firm in question, is worth quoting:—

"It appears that the Japanese firms prefer to have their own representative in Canada as they are able to understand the business conditions better than an European house. Doubtless Canadian firms are somewhat chary of doing business in a country where they do not thoroughly understand the people or conditions of trade; and, though we have not had many dealings with Japanese firms, our feeling is naturally a preference to deal with the European houses represented in Yokohama; but we nevertheless feel that as time goes on the people of the two countries will, in all probability, understand each other's methods of doing business better, and commerce between the two countries should naturally increase."

PAPER TRUST METHODS IN CANADA?

Considerable interest has been aroused by the publication of a letter from J. H. Parks, of New York, the organizer of the Manila Paper and Fibre Association in the United States and other alleged combinations of manufacturers. In this letter Mr Parks makes the statement that some of the American manufacturers had been able to obtain liberal monthly stipends from their competitors in this country in consideration of their keeping their products

out of Canada. He went on to explain that the low customs duties enacted by this country against American goods enabled American manufacturers to export with advantage to this country, while the high duties in the United States prevented Canadian manufacturers from retaliating.

Mr. Parks has, it seems, had a good deal to do in connection with his "combine" manipulations with the paper branches of manufacture, and so it is assumed that the above statements in his letter refer to Canadian paper manufacturers. Carefully looked at, however, the letter does not bear out this supposition. It is true that it was addressed to the Manila Paper and Fibre Association, but this reference really read: "Some of the associations clearing through my office have been able to obtain stipends, etc." Now, as Mr Parks was secretary of at least two other "price-machine" associations besides those relating to the paper trade, he may have intended no reference to Canadian paper manufacturers at all.

In any event, the implication is flatly denied by representatives of the industry in this country. Nor does the accusation bear any prima-facie evidence of truth. It seems absurd to imagine that the comparatively few Canadian manufacturers in existence could afford to pay such a numerically immense body of competitors to keep out of this market. The whole allegation appears to be outside the bounds of ordinary business common sense.

The mulcting of several members of the Manila Paper and Fibre Association in a heavy fine seems to have led some people to a belief that the manipulations of a trust lay behind the most innocent of business operations, not only in the United States, but in Canada. Recently there was presented to the Attorney-General of Ontario a list of firms in this country alleged to be members of a paper combine. The only action taken so far by Hon. Mr. Foy, however, has been to point out that with one exception all these concerns belong to Quebec and not to Ontario.

THE PULP AND PAPER ENTERPRISE AT KENORA.

The by-law to exempt from taxation the proposed pulp and paper mills to be erected by Andrew Anderson and associates at Kenora, Ont., was carried with practical unanimity by the ratepayers of that place on the 9th inst. The exemption, which will not include taxation for school purposes, will be for a term of ten years, after which for fifteen years there will be a fixed tax of $3,000 in addition to that for school purposes. Actual start is to be made on the erection of buildings by October 1st next, a sum of not less than $1,000,000 to be expended by December 1st, 1909, of not less than $2,000,000 before December 1st, 1910, and the mills of a full actual capacity of 300 tons per day to be in operation by June 1st, 1911. We are informed by Mr. Anderson that neither Mr. Hearst nor any Hearst syndicate has anything to do with his plans, but for business reasons the names of his financial backers are being kept strictly secret. The equipment in Kenora will be one of the largest modern and up-to-date plants, in respect to capacity and methods employed, not only in Canada, but on this continent.

—Dr. S. E. Dawson, C.M.G., Ottawa, who has been King's Printer for seventeen years, has been given six months' leave of absence, at the end of which time it is understood he will retire on superannuation.

PULP AND PAPER NEWS

Three steamers are now shipping pulp-wood from Chatham, N.B., to Portland, Me., for use at the Livermore Falls and other mills. Two more vessels will be added shortly.

* * *

R. H. Campbell, Dominion Superintendent of Forestry, has gone on his annual visiting tour to the national forestry reserves. He will inquire into the measures which are being taken to protect the forests from fire.

* * *

Gouldings, Limited, Toronto, has been granted a charter to manufacture books, stationery, etc. W. H. Goulding, of Port Carling, Ont., and Geo. Goulding 55 Wellington Street West, Toronto, are charter members.

* * *

The Miramichi Pulp and Paper Co. and the Dominion Pulp Co.'s mills at Chatham, N.B., have both closed down, the latter to permit of making certain repairs. A good many of the hands have secured temporary work at the Snowball sawmills.

* * *

The Church Book Room, Limited, Toronto, has been incorporated with a capital of $40,000 to take over the business of the Church Book Room and carry on a publishing, bookselling and stationery business. Canons Welch and Cody, Toronto, are among those interested.

* * *

Eight timber berths in the Dokis Indian Reserve, between Lake Nipissing and French River, were sold by Peter Ryan at Ottawa last month for $871,500. It is claimed that these limits, which are virgin country, and contain over 100,000,000 feet of timber, are the finest stretch of red and white pine in Canada.

* * *

The appointment of H. P. Timmerman as Trade Commissioner for the C.P.R. lines east of Montreal marks another step in the new policy which the company has entered upon during the present year, namely, the policy of an aggressive campaign in the development of the water powers, pulp areas, and mining districts of Eastern Canada, and in encouraging the founding and upbuilding of industries. Some time ago, it will be remembered, L. O. Armstrong was appointed Trade Commissioner for the lines of the company between Montreal and Winnipeg, and the success which has already attended his efforts has encouraged the company to create the new office.

* * *

The United States Circuit Court of Appeals, Chicago, declines to reverse the lower Court and the Board of General Appraisers in the matter of countervailing duties imposed by the collector on importations of wood pulp from Canada entered by John B. Heckendorn. The wood pulp in question was manufactured in Ontario from Quebec pulp wood. The importer claims that the pulp should be exempted from the countervailing clause of paragraph 393 of the Dingley tariff. No exception was taken to the imposition of the regular duties, but the additional tax was alleged to be unlawful. In denying the contention of the importer Judge Baker says in part: "In the form of a license fee for the privilege of cutting pulpwood on public lands in the Province of Quebec 40 cents a cord is collected on what is consumed in manufacture within the Dominion of Canada, and 65 cents a cord on what is exported. Looking beyond form, we find that a tax of 25 cents a cord is imposed on all pulp-wood cut on public lands in the Province of Quebec which at any point is taken beyond the boundaries of the Dominion of Canada. In its essential nature this is an export duty."

NEWS OF THE MILLS

F. Page contemplates building a pulp mill in connection with the British Columbia box factory at New Westminster.

* * *

Mr. James Deeney, an employee at Davy's pulp mill, Thorold, Ont., had the misfortune to be struck with a stick of pulp-wood, which fractured his jaw.

* * *

The mills of the Toronto Paper Manufacturing Co. and the Cornwall Paper Manufacturing Co. at Cornwall, Ont., had to stop operations owing to the break in the canal on the 29th ult. It has now been repaired temporarily.

* * *

D. Dockery, an employee for many years of the Lincoln Paper Mills, Merritton, Ont., was found in a dying condition in the mill two weeks ago. He is supposed to have fainted and fallen to the floor, which was covered with a few inches of water, and then to have died either of drowning or of heart failure.

* * *

Ouiatchouan Falls Paper Company, with a capital stock of $600,000, headquarters at Chicoutimi, has been granted a charter to construct and operate pulp and paper mills, and to manufacture pulp and paper, etc. The charter members are: J. E. A. Dubuc, J. E. Cloutier, G. St. Pierre, A. Lamontagne, L. A. Casgrain, all of Chicoutimi, Que.

* * *

On the 20th ult. the seventy-five men employed in the sulphite department at the Riordon Paper Mills, Merritton, were notified that they would be laid off for an indefinite period. The shut-down may last until fall, although it is hoped not to be so long. The company has large stocks on hand, and business is very quiet.

* * *

The British Canadian Wood-pulp and Paper Co. is making good progress on the erection of its plant at Port Mellon, B.C. P. M. Hamlin, the manager, has been making arrangements in the United States to complete the purchase of the necessary machinery. The plant will be capable at first of accommodating two paper machines with a weekly capacity of 100 tons, but will be arranged so as to permit the addition of other machines as soon as required.

* * *

Guy Tombs, general passenger agent of the Canadian Northern Quebec lines, who was recently on a tour of investigation over the Quebec and Lake St. John Railway, said in an interview that with the present market conditions most of the lumber cut in that district would be converted into pulp-wood instead of lumber. There are now, Mr. Tombs said, one paper and three pulp mills operating in this section, including the pulp mill at Chicoutimi, which is claimed to be the largest in the world. It is expected that two of the pulp mills will go into paper-making this summer. Plans have also been drawn up for the construction of two new plants, while others are talked of. West of Lake St. John is the home of the black spruce. There are over 600,000 horse-power available from the rivers emptying into the lake, which, he believes, with a sound forestry policy, would enable this Province to manufacture paper for the whole Empire.

* * *

Messrs. E. W. Backus and F. W. Brooks, of Minneapolis, the builders of the water-power dam and projectors of the pulp mill scheme at Fort Frances, Ont., were at that place a few days ago with a view to making arrangements for completing the development. When asked in regard to the proposed pulp and paper mills that were to be erected, Mr. Backus said that the mills referred to would be built as proposed, but before doing so he would require an assurance or guarantee of a

sufficient supply of pulp-wood to warrant the erection and maintenance of a large mill. He also expressed the intention at an early date to interview the Crown Lands Department in Toronto in regard to this matter, and it largely depends on his success in receiving this assurance that the erection of the mills will be an accomplished fact. It is understood that Mr. Backus' idea is for the Government to grant a timber area on a unit basis; i.e., a 20-ton mill would have so much land granted it, a 40-ton mill double that area, and so forth.

* * *

Letters patent have been issued incorporating the Hon. J. D. Rolland, manufacturer; L. Rolland, merchant, and Euphrosine Rolland, spinster, all three of Montreal, and S. J. B. Rolland and H. Rolland, manufacturers, both of St. Jerome, Que., to manufacture and to deal generally in paper and for purposes relating thereto. They will acquire and take as a going concern the business, property, assets and goodwill of the "Compagnie de Papier Rolland," with its rights and obligations for the sum of $300,000. The company will issue bonds, guaranteed by mortgages and liens on the property of the company for the sum of $200,000, $137,500 of which to be transferred as payment in proportion to the interests held by them to the shareholders in the "Compagnie de Papier Rolland," and $62,500 of the said bonds to be transferred or negotiated to pay the debts of the "Compagnie de Papier Rolland" and to meet the cost of future improvements. It will also issue shares for $100,000, and transfer the same to the following persons in payment of the interests held by them in the "Compagnie de Papier Rolland," the Hon. J. D. Rolland, S. J. B. Rolland, L. Rolland, H. Rolland, and Mlle. E. Rolland, who have subscribed the whole capital stock of $100,000, to be paid with that sum, representing their interests in the "Compagnie de Papier Rolland." The operations of the company will be carried on throughout the Dominion of Canada and elsewhere under the name of "The Rolland Paper Company" (Limited), with a capital stock of one hundred thousand dollars, the chief place of business of the said company to be at Montreal. The shareholders met last week and elected the following directors: The Hon. J. D Rolland, R. Bedard, H. Rolland, L. Rolland and Mlle. E. Roland. Hon. J. D. Rolland was elected president, S. J. B. Rolland vice-president, and R. Bedard secretary-treasurer.

—The Jenckes Machine Co., Limited, Sherbrooke, Que. (and St. Catharines, Ont.), send us a copy of their illustrated catalogue. This well-known firm makes boilers, horizontal, vertical, and locomotive, for medium and high pressure; also steel penstocks, steel smokestacks, smoke connections, tanks, refuse burners, water towers, standpipes and all kinds of steel plate work. The company's shops are now equipped better than ever before with the most improved machinery, including hydraulic riveters, flanging presses, etc. Those interested should write for a copy of the catalogue.

—Carl Riordon, chairman of the Pulp and Paper Section of the Canadian Manufacturers' Association, contradicts a report that got into some of the American journals that at a meeting of Canadian pulp and paper men in Ottawa it was resolved to urge the Dominion Government to prohibit the exportation of pulp-wood in case the United States removed the duty on pulp and paper going into the United States. The only meeting of pulp and paper men held about the time mentioned adopted a resolution urging the Dominion Government to prohibit the exportation of pulp wood, and mentioning no conditions as to what the United States Government might or might not do.

UNEQUAL COLOR ON PAPER.

In dyeing paper in the web it often happens that the color is different on the two sides, and the causes of this inequality are not only many, but difficult to discover in the great majority of instances. When we consider that the character of the raw material of the paper has a most important effect, to say nothing of the nature of the size and of the dye employed, we see at once that we are face to face with a problem which requires not only scientific knowledge, but technical skill of its solution. When mineral pigments are used, there is, of course, a tendency for the under side of the paper to assume a deeper color on account of the high specific gravity of these pigments as compared with the paper fabric itself. As a matter of fact, this causes much waste of pigment with some coarse papers, as the coloring matter not only sinks through the paper, but coats its under surface, and, of course, it is rubbed away in the course of manufacture. With closer, and especially with heavily sized papers, this loss of coloring matter does not occur, but at the same time there is not uncommonly sufficient penetration to cause a marked difference in shade between the two sides of the paper. In the case of very dense and heavily sized papers it sometimes happens that we have an effect the exact reverse of that which we have just now been considering. The penetration is almost nil, so that the great majority of the color is found in the upper surface of the web.

We have here several considerations which must be of the utmost value to the paper-maker. We see two causes as influencing the distribution of a pigment, and it is clear that the same causes will obtain to a large extent in respect of dyes. These two influences are closeness of texture and the sizing of the paper. Hence, whenever it is a question of securing uniform penetration of a paper which would otherwise show differences on the two sides, it is important to apply the dye or pigment simultaneously above and below the web, and machinery can always be had for doing this. The textile dyer has plenty at his command. At the same time it must be remembered that when it is a question of coloring papers which by reason of the looseness of their texture or absence of size are easily penetrable and do not exert any notable filtering action, the ordinary processes and plant in use in the paper trade for coloring paper fulfil every requirement.

It is a remarkable fact, hitherto unexplained, that, other things being equal, an unsized paper requires more dye or pigment, as the case may be, to bring it to any desired shade of color than a sized paper. No doubt the size has a lake-forming action with an artificial dye; but this interesting question has never been investigated. It surely deserves to be worked out, even on account of its economic bearings on the cost of the production of dyed paper.

The importance of the question of dyeing various sorts of paper is obvious. The paper-maker has, when it is a matter of colored papers, to satisfy as much in the way of requirements from his customers as regards the ordinary use of the paper as if the paper were undyed, in addition to giving the paper of the color which they desire. Not one in a thousand of these customers knows what complications are introduced when it becomes necessary to color a paper.

There is another point to be considered with reference to penetration in paper dyeing. This is that coal-tar colors are applied to it in solution—i.e., in a liquid form—which cannot be done with the insoluble pigments. It might have been thought that this very fact was an insuperable objection to the use of mineral pigments in conjunction with artificial dyestuffs. Anyone would think that the filtering action of the paper fabric would separate them hopelessly. Such, however, is not always the case; and it is easy to produce

paper dyeings by judicious combinations of mineral and organic coloring matters which could by no possibility be obtained with either the one or the other alone. Of course, the lightest mineral pigments available must be chosen. There is but little difference in the osmotic power of solutions of organic dyes. At the same time, the character of the paper must be the object of expert selection. Whether its degree of porosity depends on sizing or on closeness, or on both, it must be just so as to avoid gravitational differentiation between the two sorts of coloring matter, as far as possible, and not to allow a proper penetration into the substance of the paper.

Very heavy pigments, such as barytes, cannot be used in conjunction with coal-tar colors with any hope of success.

Pressing finished dyed paper has but little effect on the uniformity of the result.

It is possible with suction boxes to distribute a coloring matter more uniformly than could have otherwise been the case through the substance of a sheet of paper, but such accessories are useless, except under special circumstances of closeness and sizing. Even then their employment is not advisable. In the case of mixtures of organic and inorganic coloring matters, the forced draught, so to speak, caused by mechanical suction rather intensifies than otherwise the separation between solid particles and dyestuff solutions. In any case the effect of the suction is evidently controlled by the nature of the paper, as regards closeness of texture and the amount of size, if any, which it contains.

Let us now suppose that all these difficulties have been overcome, and that our paper comes to the drying cylinders colored throughout the same. Even now our troubles are not yet over. The drying, and still more the calendering, may make the color look quite different. As a rule, calendering darkens the shade, and the more so the hotter the calender roller and the heavier the pressure. It is, of course, well known that the calender lustre is produced by the paper passing between naked iron rollers and rollers covered with paper, the latter giving the friction necessary to prolong the action of the heated iron. Now, if it can be done quickly, the inequality of shade caused by calendering, i.e., by only one side of the paper touching the hot iron cylinders, can be rectified by turning the paper over and passing it through the calender again in such a way that the side which touched the paper-covered rolls during the first passage now comes into contact with the heated iron cylinders. It will be found that if this reversal is rapid, and if—and this is of prime importance—the paper reaches the calender at the right degree of dryness, we shall obtain a paper of the same color and shade on both sides. It is essential, however, that the paper should reach the calender dry, i.e., that the heat and pressure should be expended in smoothing and lustring only. —Paper Fabrikant.

—The Dominion Government has made great strides towards the solution of the reforestration, or rather afforestration problem. This year the number of applications for trees for planting purposes was 3,206, and the number of trees distributed was 1,900,000. Of this number, so far as reports now received indicate, about 80 per cent. lived.

—J. F. Campbell, general manager of the Canada Paper Co., in an interview in Toronto recently stated that sentiment was rapidly forming in Quebec in favor of an export duty on pulpwood. If things drifted along as at present, he is reported to have said, without any action on the part of the United States in respect to the duties it imposes on pulp and paper, then the Canadian public was being so awakened to the need of an adjustment that an export duty would be inevitable in the near future.

DRIVING PAPER MACHINES.

A recent article in the "Papier-Zeitung" says that every paper machine can only drain and dry a certain quantity of material in a minute, being able to run quickly on thin paper, but having to go more slowly when thicker grades are being reduced. Hence frequent variations of speed are necessary where nearly uniform weights are not made. Quick running machines, all working at the rate of some 500 feet a minute on news, must as a rule be so arranged that they can produce paper three times as thick at one-third the speed. The old principle that each paper machine should have its own motive power independent from that of the rest of the plant is said to be still applicable.

It considers the most economical and suitable drive is by the high-pressure steam engine, the speed of which can without trouble be considerably varied, the exhaust steam being used for drying.

As new large paper machines require a motive force up to 300 horse-power, it is recommended to drive the parts whose speed is not to be altered by a special motor and the other parts by a different and larger motor, the exhaust steam being in both cases conducted into the drying cylinders. Should the exhaust steam prove insufficient for drying it can be supplemented by the automatic introduction of live steam, the maximum of convenience and economy of making being thus attained.

—Bulletin No. 6, of the Sandy Hill Iron and Brass Works, Sandy Hill, N.Y., describes a new reel, which eliminates the great waste of finished paper that has heretofore occurred at this point on the machine. This loss often amounts to 200 or 300 pounds per day. This waste is caused by the machine tender requiring too much time to start and stop his machine and to adjust the tension of his sheet. In the Sandy Hill reel the tender starts and stops the machine and makes all adjustments for tension with one lever on the front of the machine.

AN IMPROVED "DOCTOR."

A British patent has been granted to W. H. Dixon, of Grimsby, for an improved "doctor" (or "slice"), the object being to cause a better quality of paper to be produced by the machine.

On modern paper-making machines these slices are usually made in two parts so as to be extensible, and of bronze, or like non-corrosive metal or alloy, and usually about six inches deep and ¼ inch in thickness, or thereabouts. According to Mr. Dixon's invention, the slice is made of greater thickness than hitherto, say, for example, from 2 inches to 5 inches in thickness, and of any desired depth and length; and the underside of the slice, beneath which the pulp passes to travelling wire, is shaped so that it presents a passage for the pulp gradually decreasing from the side at which the pulp enters beneath the slice to the side at which the pulp leaves the slice, the said underside being preferably shaped to a parabolic curve. The dimensions of this slice are six inches deep and 3½ inches in thickness, which dimensions in practice are found to give good results.

The inclination of the underside of the slice has the effect of accelerating the passage of the pulp through the restricted outlet onto the travelling wire, this action being assisted by the head, or accumulation, of pulp at the rear of the slice, the acceleration varying inversely with the increase of distance to which the slice is raised. The curvature, or inclination, of the underside of the slice may be varied according to the nature, or thickness, of the required paper.

It is claimed that a slice made as described will give to the pulp a speed of flow nearly, or exactly, correspond-

ing with the speed of the travel of the wire, this resulting in a more equal distribution of the material, and consequently a more perfect sheet of paper than is the case with ordinary slices.

PAPER MAKING QUESTIONS.

The Society of Cellstuff and Paper Chemists has drawn up a series of questions and sent them to the laboratories of the principal German papermakers' schools and of certain high schools. The points to be dealt with affecting manufacturing processes are as follows:—

(1) In what way can pulp be most advantageously produced from sisal hemp?

(2) Within what limits can turf claim value as a raw material for paper?

(3) What are the practical limits within which brown wood pulp can be brought to an improved condition?

(4) Questions affecting the bleaching of rags boiled with lime.

(5) Addition of lime in boiling rags.

(6) Differences in the purity of rags after boiling with lime and with soda. Influence on their subsequent washing and bleaching.

(7) Determination of substances causing the temporary reddening of sulphite cellstuffs during bleaching.

(8) What substances cause the less successful bleaching of soda and sulphate wood sellstuff as compared with sulphite cellstuff.

(9) What are the conditions under which resinate of alumina is developed in the precipitation of rosin size by means of sulphate of alumina? What are most important properties of resinate of alumina, particularly as to determining its presence in paper?

(10) Importance of Fabrion's observations as to the auto-oxidation of resin for use as size.

(11) Indanthian-blue as a paper dye.

(12) Under what circumstances and in what degree can the removal of acids from the refuse water of sulphite pulp manufactures be dispensed with?

In connection with the testing of raw materials and paper the following problems are submitted:—

(1) The disassociation of rosin size, according to the degree of dilution in its being dissolved for size.

(2) Sources of errors in the determination of the total amount of rosin in rosin sizes, particularly in the drying of the recovered rosin.

(3) Impurities in cellstuffs resulting from sulphur compounds.

(4) In what pulps is there an increase of weight, if they are subjected to heat a long time to obtain the dry weight? Extent and causes of such increase.

(5) Exact investigation in cellstuffs of the substances usually designated as rosin, soluble in ether, alcohol, petroleum, ether, etc.

(6) The resistance of the size in paper against alcoholic and alkaline fluids.

(7) Process of testing for distinguishing bleached and unbleached ground wood in papers.

—The Ontario Government, as the first step in its reforestation scheme, will establish farm forest nurseries throughout the Province in the neighborhood of lands not suitable for agricultural purposes. In connection with their forestry service the Government contemplates utilizing the services of university students who are taking courses in forestry.

—G. Middlemist-Downer, of Hacking, Adams & Downer, Limited, pulp and paper merchants, London (England), is on a visit to Canada and the United States. His firm exports considerable esparto and coated paper to this country. He expects to appoint an agent in Toronto to permanently represent his house in Canada.

THE PHYSICAL QUALITIES OF PAPER *

By R. W. Sindall, F. C. S.

Material and Manufacture.

The value of a paper in reference to physical properties is usually judged by such empirical methods as its behavior when torn or crumpled, and its condition after being roughly handled.

The verdict generally passed upon the paper which offers little resistance to such rough and ready tests is expressed in the significant and familiar phrase: "The paper is made of rotten stuff."

Now, broadly speaking, the strength of a paper is determined by the constitution and structure of the fibrous elements which compose it, but in the study of physical properties it is necessary to take into consideration not merely the material of which the paper is made but also the methods of manufacture. This is evident from the well-known fact that one paper-maker makes a poor sheet from good material, while another can produce a fairly good sheet from poor stuff. Hence some knowledge of the conditions of manufacture which govern possible variations in the quality of the paper, together with an insight into the physical constitution of the raw material, is essential to a proper appreciation of the enormous difference in strength exhibited by a high-class rag paper as compared with that of a common printing paper.

It is only by such means, for example, that the great contrast between a blotting paper and a strong ledger paper, both of which may consist entirely of cotton rags, can be properly understood. In proportion as the two factors, material and manufacture, are studied together the great differences so patent to the ordinary observer are capable of expression in more definite and precise terms than that contained in the words "rotten stuff."

Strength of Paper.

The most important physical quality, or property, of a paper is its strength as measured by the tensile strain which, applied to a strip of given length and width, produces fracture. The strength of paper is also frequently recorded in terms of the force necessary to burst a sheet of definite area. These two qualities are the tensile strain and bursting strain respectively.

Tensile Strain.

There are several testing machines available for determining the tension necessary to break a strip of paper. They are based upon the principle of submitting a strip of definite width, say 1 inch, and of definite length, 5 or 6 inches, to the action of a spring or weight under suitable conditions.

In the absence of any agreed standard for the size of the strip it is necessary to record not only the weight in pounds which produces fracture, but also the dimensions of the strip itself.

The final result is influenced to some extent:—

(1) By variations in the substance and quality of the paper. The effect of such variations is reduced to a minimum by taking the mean of ten to twelve readings.

(2) By the length of strip tested. This is mainly due to variations in the substance of the paper, and the taking of several observations practically nullifies any errors which might occur.

It is of interest to note that theoretically a short strip is more likely to give a good tensile strain than a long one, a fact which can be proved experimentally and which may be seen from the following example.

Imagine a strip of paper 16 inches long which breaks at 20 lb. Owing to

*Read at the meeting of the Library Association, London, November, 1907.

slight variation in the substance and thickness of the paper it is easily seen that if the strip had been tested in four pieces, each 4 inches long, the four separate tests might have been 22, 20, 21, 21 the mean of which figures works out at 21 lb. If the weakest spot of the paper had been near one end it is conceivable that with the strip only 12 inches long this weak spot would have been eliminated and in that case the test would show 21 lb., i.e., the next lowest reading.

(3) By the width of strip. In general terms it is sufficient to suggest that the breaking weight is proportional to the width. That is to say, a 2 inch strip will require double the fracture weight of a 1 inch piece. In practice this proves to be the case.

Breaking Length.

The German Paper Testing Institute has long adopted an ingenious method of recording the tensile strain of a paper so as to obviate the necessity of recording the dimensions of the strip by calculating the actual length of paper which if suspended would break of its own weight. The following example will serve to illustrate the principle of the method in which this length is calculated:—

Experiment.

What is the breaking length of a paper 20 × 30 inches, 480 sheets to the ream, weighing 48 lbs.? The test on a strip 5 inches long and 1 inch wide gave a breaking weight of 22 lbs.

The weight of 480 × 20 × 30 sq. inches is 48 lbs.

The weight of strip 5 × 1 sq. inches is $\frac{48 \times 5 \times 1}{480 \times 20 \times 30}$, that is $\frac{1}{1200}$ lb.

$\frac{1}{1200}$ lb. is weight of a 1 inch strip 5 inches long.

22 lbs. is the weight of a 1 inch strip (5 × 1200 × 22) inches long, that is, 132,000 inches or 3,666.6 yards.

A strip 3,666.6 yards long would weigh 22 lbs., and if suspended would break owing to its weight.

The breaking length of the paper is then 3,666.6 yards.

Expressed in general terms the breaking length of a paper is found by the following data:—

Let w = weight of a test strip measuring b by 1 in. (breadth and length).

W = breaking strain by test.

L = breaking length.

Now W = weight of a strip L × B inches (breadth of the strip = B) and

$$\frac{LB}{lb} = \frac{W}{w}$$

but B = b (whatever the width b for the test strip, we are calculating the breaking length for that width).

$$\text{Hence } \frac{W}{w} = \frac{L}{1}$$

$$\text{or } L = \frac{W}{w} \text{ times } 1.$$

Bursting Strain.

In the machine used for ascertaining the bursting strain, a sheet of any convenient size is clamped between two circular rings in a horizontal position. Strain is applied to the surface of the sheet by means of a small piston forced through the paper by hydraulic pressure, and this is recorded by an ordinary pressure gauge registering lbs. per square inch.

For comparative tests this type of machine has certain advantages.

Machine and Cross Directions.

It is a matter of common observance that ordinary printing papers tear much more readily in one direction than another, and also that the resistance to tensile strain in the direction parallel with one edge of the sheet is much greater than in the direction at right angles. Such a difference is readily noticed with cheap paper even by a rough hand test. Thus a common news-

paper will break at 8 to 10 lbs. in one direction, and perhaps fracture at the low resistance of 1 to 2 lbs. in the direction at right angles.

A hand-made paper will not show such extreme variations, the strength of the sheet being nearly the same, though not quite, in the two directions.

These important distinctions must be explained by reference to the conditions of manufacture.

Position of Fibres.

In the case of a sheet of paper made by hand a mixture of pulp and water is lifted out of the vat on to a rectangular frame or mould of special construction. A peculiar side-to-side and back-to-front motion is imparted to the mould by the workman as the water drains through the wire surface of the mould, which causes an uneven distribution of the fibres pointing in every direction. Hence there is no reason why the cohesion of the fibres should be more in one direction than another, though in actual practice this theoretical equal distribution is never obtained.

In the case of a machine-made paper the mixture of pulp and water flows in an even stream on to an endless horizontal wire cloth travelling rapidly forward (with cheap news at the rate of 450-550 feet per minute), and in which it is only possible to produce side-to-side shake. The fibres thus tend to assume a position parallel with the direction in which the wire is travelling.

A striking illustration of this peculiarity may be seen in an ordinary mottled paper such as "Silurian" note. On one side it will be noticed that the deeply stained fibres which cause the "mottled" appearance point in every direction, whereas on the reverse side a great number are parallel with one another and with the edge of the sheet of paper. The latter side is the under surface of the sheet first formed on the wire. Most of the water has drained away before the fibres felt the influence of the shake so that the majority of them point in one direction. The fibres on the top side of the sheet are more equally distributed because the shake has had time to assert itself before the water above the bottom layer has drained completely away.

In the case of cheap printings the effect of the position or "lay" of the fibres is readily noticed when the paper is torn. In one direction the paper tears easily and the torn edge shows only a few fibres sticking out at right angles, whereas in the other direction the paper resists the strain, and the torn edge then exhibits a large number of fibres projecting at right angles.

The direction of greatest strength would thus be the direction of least resistance to a tearing strain, a factor of considerable importance in book production, for it is clear that the position of the sheet in a book determines whether the direction of greatest resistance to tearing strain is correctly placed with due regard to the treatment by readers.

The Fibre Unit.

In the face of such facts it is not surprising to learn that the physical qualities of a paper are best appreciated by a study of the "fibre unit." The sheet of paper is not altogether a homogeneous substance like a sheet of iron with properties capable of being altered and modified by heating, casting and rolling. It is true that the strength, appearance and finish of a sheet of paper can be considerably modified by treating it as a homogeneous mass, but only to a limited extent.

The difference in the behaviour of a high-class rag paper and an ordinary esparto book paper when these are torn between the fingers, and in the appearance of the fibrous edges so obtained may be taken as the starting-point of observation on what is called "the fibre unit."

A cotton fibre is about 25 millimeters long (1 inch) and 0.03 millimeter diameter. It is tubular in shape, twisted and turned about its axis, like a corkscrew.

A linen fibre is also 25 millimeters long (1 inch and 0.016 millimeter in diameter.

The central canal is very small, and the fibre is thickened at intervals. The fibre generally resembles a twig with frayed-out ends.

An esparto fibre is only 1.5 millimetre long and .015 millimetre diameter. The pulp produced from the raw material also contains a large proportion of small cells and vessels which are not fibes in the accepted sense of the word.

A chemical wood pulp contains broad, flat ribbon-shaped fibres of varying lengths.

A mechanical wood pulp consists of a mass of fibres, some long, coarse and harsh, others small, shapeless and all rather inflexible.

Influence of Beating.

The variations that might be expected in the quality and strength of the finished paper from such differences in the physical structure of the "fibre unit," are capable of still further extension by the important process of "beating." This is the operation in paper-making which produces the greatest variation in the nature of the paper.

In "beating" the pulp mixed with a suitable proportion of water is submitted to the action of a number of flat metal bars or knives, some of which are fixed and others arranged on a large cylinder or drum. The beater roll, as it is termed, can be raised or lowered so that the distance between the knives on its circumference and the stationary knives in the bottom of the machine trough can be varied. The pulp circulates continuously in the trough, passing repeatedly between the two sets of knives.

The conditions of beating may be varied:—

(1) By using blunt or sharp knives.

(2) By raising or lowering the roll of rotating knives.

(3) By prolonging the period or time of beating.

(4) By alterations in the temperature of the mixture, and so on.

A few typical examples to show the effect of such conditions will be sufficient to illustrate the principles involved.

Blottings.

Tender cotton rags beaten quickly for one to two hours with sharp knives produce a highly porous paper. The tubular cotton fibre is cut up into short pieces with smooth ends still tubular in shape. This treatment favors a high degree of absorption.

Ledger Papers.

Strong cotton rags beaten for eight to nine hours with blunt knives slowly and intermittently lowered. The fibre is torn and dragged into short pieces rather than cut, being often cut and bruised out with splayed and broadened ends which greatly favor "felting power." It then holds water tenaciously, and as this evaporates the fibres shrink together into a close, dense mass.

Book Papers.

With esparto such great differences are not possible. The fibre is short and this limits the number and extent of variations. Its chief characteristic is its soft flexible nature which renders it suitable for illustration processes.

Cheap News.

The fibre of mechanical wood has only the merit of cheapness. It possesses little "felting power," or capacity of cohesion. Being merely ground up wood it is harsh, inflexible, and the presence of non-fibrous constituents prevents any extended physical modifications being achieved by beating.

Resistance to Wear and Tear.

That rag paper possesses physical qualities of such a high degree in relation to its resistance to crumbling, folding and ordinary rough usages can readily be understood. The cohesion of fibres of maximum length, the ends of which have been teased or frayed out, results in a strong tenacious sheet. Such a paper can be crumpled up between the fingers into a ball, and smoothed out at least 100 to 120 times until it is as soft as a velvety rag without splitting or showing any minute holes when held up to the light.

(To Be Concluded).

GORDON PULP AND PAPER CO.

The Gordon Pulp and Paper Company, Limited, Dryden, Ont., have most of their plans perfected for the erection of pulp and paper mills. They will put up a forty-ton sulphite mill, and a ground wood mill equipped with 8 grinders. A two-machine paper mill will also be erected, one machine to run on news and the other on manillas. The new mills will be situated on the Wabigoon River where a head of 47 feet and a very uniform flow of about 4,500 horse-power can be obtained. Already a saw mill and brick yard have been put in operation by the

Charles B. Gordon.

company in order to assist in the larger undertaking. The contract for the development and buildings will be let at once, and the machinery for the pulp mills will be ordered during the summer.

The officers of the company are Samuel Nesbitt, president; Menno L. Webber, vice-president; Charles B. Gordon, general manager. Mr. Gordon is a graduate of the School of Practical Science, and has devoted considerable time to the study of pulp and paper making. It is the intention of the new company to cater largely to the growing Western trade, and they will have splendid shipping facilities on the main line of the Canadian Pacific Railway.

TIMBER RESOURCES OF NOVA SCOTIA.

The Lumbermen's Association of Nova Scotia held its convention at Liverpool, N.S., on the 1st and 2nd inst., when several particularly interesting addresses were made on forest conditions in that Province.

F. C. Whitman estimated the forest lands of Nova Scotia as comprising 5,803,350 acres, of which 1,469,750 acres are Crown lands. He highly commended the forest ranging system, in force in this Province, which has been effective in preventing forest fires, the total yearly cost being only about six thousand dollars, or ninety cents per square mile. Speaking of reforestation, he said the quick growth of trees in Nova Scotia, compared with less favored countries, makes it possible to get a crop in a generation, and find a second one growing. Land covered with a young growth of pine, spruce or other wood was a saleable proposition, and if there is truth in the statement that in twenty years there will be a timber famine, wood the size of a pulpwood stick is likely to be the timber of the future at prices beyond present belief.

Dr. G. E. DeWitt referred to an address delivered by Dr. Fernow at the Forestry Convention at Ottawa in 1906, when he said: "That the sooner you realize that the whole responsibility of the management of your timber wealth is chargeable to your Government, the sooner you will find the remedy." We, therefore, plead that the Government make a careful survey of the land now in the possession of the Crown:—

First—Giving careful data of its resources; whether the source of water power, or fit for timber or agriculture or neither.

Second—That restrictions may be made in the cutting of timber and in the cutting and transportation of pulpwood.

Third—That when the Government grants land to individuals or com-

panies that it shall not be a grant in perpetuity.

Fourth—That the Government make it imperative upon municipalities to appoint or pay fire-wards in every county, not leaving the appointment to the discretion of the municipalities.

Fifth—That a system of economics of forestry be taught in our public schools, that the younger and coming generation may be taught that it is the right and duty of the people and the Government to safeguard the country's future by enacting such laws as shall conserve her natural resources.

J. E. A. Dubuc, managing director of the Chicoutimi Pulp Co., and Prof. Fernow, of Toronto University, also spoke.

SCHILDE DRYING SYSTEM.

J. Marx & Co., 133-9 Finsbury Pavement, London, E.C., sole agents for Great Britain and the colonies for the Schilde system of drying apparatus for wood pulp, paste, card, mill and leather board, have sent us a pamphlet describing that process. The proper solution of the drying question often means the difference between success or failure for the mill. The "Schilde" apparatus combines a thorough consumption and utmost possible use of air, heat and space with the largest possible saving in attendance, and is claimed to produce a quality in no way inferior to that obtained in the cold-air drying process. A feature of the apparatus is the ease with which is may be installed.

The apparatus consists principally of a long canal with doors at both ends, through which two chains convey the rods, with clips to hold the boards. These chains are endless so that the clips, after having passed out of the drying chamber, return above the canal to their starting place. Either beneath, adjoining or above the apparatus (possibly even in other rooms or floors if more convenient) is placed an air-heater, fed by an air-fan. The current of air, after having been heated, is conducted into the apparatus and blows against the boards. The machine requires very little attendance, indeed. The wet boards are hung up on the couple of clip-rods outside the closed door at one end whilst at the other the dry material is taken off. For larger apparatus attendants will be stationed at both ends, so that the wet and dry boards are handled simultaneously, while for smaller ones one person suffices to do the work at both ends. If the installation is fitted with a mechanical drive, the whole work will be done automatically by simply pulling a crank lever. The operators have nothing to do but to hang up and take down the boards.

From the above it will be seen that the attendance could hardly be more simplified. The clips, too, owing to their practical and suitable construction, allow of the work being done in the shortest possible time. It requires one attendant for six tons of thick boards in twenty-four hours, two for medium thicknesses, and three for very thin boards.

The problem of the best manner of drying is solved by adopting the counter current principle, which has been most advantageously employed in the apparatus. The hottest and dryest air meets the boards when they are in the last stage of drying, i.e., when the moisture is most difficult to expel. Continuing its way through the canal the air then strikes boards containing more moisture till at last it acts upon the batches which have just entered and are quite wet. It is then already almost saturated with moisture and cooled, but will still absorb a good deal of humidity and will prepare the boards for further drying by warming them.

Thus the material is at first put into a temperature of 68 to 77° F., which gradually increases as the progress of drying progresses in intervals of five to fifteen minutes by approximately 4° F., till at last it reaches about 158° F.

The natural consequence of this gradual increase in temperature is that the boards scarcely warp, and that the drying is effected by degrees, and very uniformly.

The boards remain subject to the hottest temperature for a few minutes only, when they are nearly dry, and have thereby become resisting. The sprinkling causes no difficulty and waste by creases is almost avoided, since the boards are almost quite flat. This distinguishes the Schilde apparatus from the drying-room, with high temperature from beginning to end, where the goods are over-dried in some places and remain wet in others.

THE COST OF PREVENTING BOILER SCALE.

Some time since Arthur D. Little, chemist, of Boston, was called upon by one of his clients controlling a considerable number of boiler plants to study the conditions therein with a view to standardizing the methods of preventing boiler scale and reducing the expense therefor. The following general abstract will doubtless prove helpful to boiler owners and operators:—

In seven mills he found soda ash and kerosene in use, either alone or in combination with each other, while in three mills a sumac compound was employed. The price of the latter was 10 cents per pound, its approximate composition being: Water, 28 per cent.; insoluble matter, 9 per cent.; sodium carbonate, 43 per cent.; sodium phosphate, 13 per cent.; organic matter (tannin), 7 per cent.

Another mill was using a special compound costing only 2¾ cents per pound with an approximate compound of alkali, 14 per cent.; insoluble matter, 5 per cent.; water and organic matter, 81 per cent.

Still another mill was using a compound at 6 cents per pound composed of water, 10 per cent.; soda ash, 53 per cent.; common salt, 33 per cent.; organic matter, 4 per cent.

It was found that all the mills in the combination which used special compounds were expending nearly $1,300 per year for boiler compounds. Those which were using only soda ash and kerosene were expending very much less per horse power, although practically the same water supply was provided.

The method of applying the soda ash was investigated, and it was found that in the case of a number of mills there was a mistaken idea of the use of a boiler compound. The methods employed in these mills, while differing somewhat in details, were to add the soda ash once a week and clean the boiler. The true method was shown to be to add the soda ash in small quantity and continuously, and then keep the boiler in a condition so that by frequent blowing off it is kept clean.

It was shown by Mr. Little that a considerable saving could be made and a better result secured not only by reducing the cost of the compounds themselves, but by keeping the boilers in first-class condition and preventing the formation of scale, thereby reducing the amount of coal required to produce the desired amount of steam.

GEO. POWLEY PAPER CO., LTD.

A new company, with a capital of $50,000, has been formed under the above title as successors to Geo. Powley & Co., wholesale paper merchants and importers, 60-62 Front Street West, Toronto. The old firm commenced business in 1905, and during their three years of business have secured an extensive trade throughout Ontario. Six travellers cover the ground equally divided between city and country, and a branch was opened in Hamilton some four months ago. Geo. Powley has been connected with the paper business for the last thirty-five years, being with the old firm of Taylor Bros. for a large number of years, and enjoys the reputation of

being one of the best-known and most popular paper men in Ontario. The manager, C. V. Syrett, has been brought up among paper and paper surroundings since a child, and the extensiveness and success of the business are a good indication of the hard work he has put into it. The new company may extend somewhat in the near future. The board of directors is as follows: Geo. Powley, president; Miss T. E. Powley, vice-president; E. W. J. Owens, director; J. O. Patterson, treasurer; C. V. Syrett, secretary and manager.

USEFULNESS OF THE CHEMIST.

The public has been slow to appreciate the practical character and value of the work of the industrial chemist. He is no mere analyzer of compounds into their primary elements, but a veritable interpreter of things chemical. By the aid of the microscope he gives definite commercial value to his investigation; he becomes in effect the eyes of the purchaser spying out and reporting upon the composition and the quality of the material he buys.

For centuries paper has been judged by feeling it and tearing it. Men have become wonderfully expert in the business, but their judgment has been comparative only. Now the chemist is called in to determine real values. His report is an apparently simple thing, like that herewith quoted from the records of the well-known chemist, Arthur D. Little, of Boston, but it is eminently practical. The inquirer merely wanted an expert statement of the materials (not the chemical elements) employed in manufacture, and this is what he got—certainly good evidence of the practical character of the work of the industrial chemist.

"I have examined the package of envelopes which you sent, and beg to report thereon as follows:—

"The stock from which the envelopes are made is composed mainly of spruce fibre with a small proportion of rag stock, and a little poplar or very similar fibre, e.g., cotton wood. The proportion of poplar found is so small as to suggest its accidental occurrence in the spruce pulp.

"The paper has been very lightly sized with rosin, but heavily animal sized, i.e., it contains a large quantity of glue. The filler used is almost entirely hydrated calcium sulphate, doubtless in the form of crown filler or pearl hardening.

"The gum used on the flaps is very largely, if not entirely, dextrine of very good quality. Owing to the large amount of glue in the paper it is difficult to prove the absence of glue in the gum used on the flaps; but if present at all it is in very slight amount. We are not able to detect the presence of gum arabic or other vegetable gums. The color and odor suggest a rather yellow imported dextrine rather than one of our white American products."—Exchange.

MACHINERY FOR HARMSWORTH MILL.

The Anglo-Newfoundland Development Co. has given to the Bagley & Sewall Co., Watertown, N.Y., an order for three large straight Fourdrinier paper-making machines, especially adapted for news paper. Two machines will be 156 inches and one 124 inches wide. It is said they will be the fastest, most productive machines ever made. The contract was signed by Stuart D. Lansing, of the Bagley & Sewall Co., and by M. M. Beeton, who is president of the Anglo-Newfoundland Development Co., and also of the London "Daily Mail," which is the chief newspaper enterprise of the Harmsworths, who control this great Newfoundland pulp enterprise. The mill is being built under supervision of the great paper mill engineer, Geo. F. Hardy, of

New York, who has been concentrating his personal energies on the work for some time past. Two of the machines are to be delivered early in the fall and the other one next spring. The total machinery will make about one hundred carloads, which will be shipped from New York or Boston direct to Louisport, Nfld., which is near the mill at Grand Falls.

SPONTANEOUS HEATING OF BLEACHING POWDER.

The "Dyer and Calico Printer" quotes a case of spontaneous heating of bleaching powder which occurred in Germany. Parcels varying in their contents from eleven pounds downwards were stocked in a cool, dark place. Nevertheless, they set fire to the surrounding matters. Dr. Lunge has put on record that the exclusion of air is no safeguard against the development of heat caused by the intermolecular action in the powder itself, an action which may be accelerated by exposure to light or heat, or both, but which takes place even when these agencies seem to be completely excluded. The development of free gaseous chlorine, the result of this decomposition, may burst the containing vessel, and thus damage may be caused independently of the waste of bleach. Hence, it is of great importance to exercise the utmost caution in packing bleach, especially during warm weather. It must not be forgotten, too, that, like quicklime, bleaching powder heats up on the access of moisture. It must, therefore, be stocked without access of light, heat, or moisture.

MODERN MIXTURE DYEING METHODS FOR PAPER PULP.

We may distinguish (a) mixing in the pulp (b) mixing in the wires; (c) mixing on cylinder machines; (d) mixing by means of the first felt press, before the paper comes to the last drying cylinder and on a goffering or dyeing machine.

(a) The dyeing of the paper is done in the hollander just before it is emptied, so that the fibre comes out as nearly as possible in its natural form, and so that the marbling comes out sharp with a minimum of bleeding.

As regards wood stuff it is dyed in the hollander with sulphuric acid and Glauber's salt at about 70 deg. C. with an aniline dye. Care must be taken to use as little dye as possible. Otherwise the excess unabsorbed by the wood will cause bleeding when the white pulp is mixed in. As regards coloured cotton rags they usually save much dyeing, as they can be washed, but in cold water to prevent stripping, and then torn up for mixture with white pulp. Wood pulp for marbled papers must be dyed on an alumina mordant in the pug mill, used for disintegrating the wood. The dyer's wood pulp must be thoroughly rinsed before mixing it with the white pulp so as to remove all unfixed dye, whereby bleeding is prevented. An alum bath intercalated among the rinsings saves much time, as then less rinsing is necessary. Judgment is, however, necessary to avoid waste of alum. The alum bath must not be too strong, and must come in the right place, i.e., after the second rinsing.

(b) The colored pulps are placed in a chest over the wires. From this chest they reach the web just after it has passed the first sucker. The draining is then finished by the suckers farther on. Care must be taken that the web is fairly close before the dyed stuff is run on to it, whether upper wires are used or not, so that the marbling stuff does not pentrate it, but is only closely incorporated with its surface. Neglect of this precaution will alter the effect for which the coloured fibre or the mixture of coloured fibres has been prepared. Paper thus prepared should not run less than 50 grammes at least per square metre—say, 1½ oz. per square yard.

(c) Cylinder machines are used mostly for cardboard. The taking-off felts lead webs of the different pulps to the couch-roll, where they are combined. We have here the advantage that the inside of the finished paper can be made of inferior stuff.

(d) The dye solution is run direct or between rollers between the first upper press roller and a closely-fitting scraper in various places, so that the dye comes on to the paper from the roller. This, however, marbles one side only. Attempts to marble the other side at the same time with a second press roller have not as yet given good results. Good effects, however, are obtained by interposing a grooved arrangement in front of the last cylinder whereby sharp red, green, blue, and yellow lines can be marked on the paper.

The papers dyed by the methods here described are used for wall-papers, serviettes, for bookbinding and for paper-box making, and also for other ornamental purposes.—Zentralblatt.

TRADE ENQUIRIES.

The following trade enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to "Superintendent of Commercial Agencies, the Department of Trade and Commerce, Ottawa, or the "Pulp and Paper Magazine," Toronto. Quote the reference number when requesting addresses :—

573. **Paper.**—A South African wholesale importing and exporting house desires to be placed in communication with Canadian manufacturers of all kinds of paper.

743. **Wood-pulp.**—A firm in Birmingham possessing a connection among buyers of wood-pulp—moist and dry, mechanical and chemical—and strawboard, would like to represent some Canadian manufacturer of these goods for the United Kingdom.

845. **Wrapping Paper.**—A dealer in St. John's, Antigua, desires prices of wrapping paper and other stationery from manufacturers.

THE LATE MAJOR ACKERMAN.

At a meeting of the Canadian Wood Pulp Association the chairman advised the members of the sudden death in New York on the 21st ult., of Major J. F. Ackerman, of the firm of Perkins, Goodwin & Company, New York, and president of the Ouiatchouan Pulp Company, Limited, whereupon the following resolution of condolence was unanimously adopted :—

"The members of the Canadian Wood Pulp Association desire to express their regret in recording the death of their late colleague, Major J. F. Ackerman, and in doing so take the opportunity of paying tribute to his efforts and able assistance in furthering, though only for a short period, the objects of this Association. Major Ackerman was an enthusiastic believer in the future of the Pulp Industry in Canada, and by his death the members have suffered a severe loss owing to a dependence placed on his advice and experience on the complex questions which must arise from time to time, and that this resolution be inscribed upon the minutes of the Association and copy thereof sent to members of his family."

ESTIMATION OF DRY STUFF IN CHEMICAL PULP.

C. Hofmann has proved that sulphate pulp begins to decompose at 90 deg. C. At the same time it would be difficult to restrict the drying temperature to 90 deg. C., not only on account of the practical difficulties in the way of preventing

the heat from rising higher, but also because it is often impossible to dry the pulp properly at so low a temperature. At the same time the decomposition of the pulp, even at 100 deg. C., if the drying is done rapidly, is insignificant, and it is quite impossible to get the full yield, whatever precautions may be adopted in the drying process.

Nevertheless, it is important to ascertain the amount of the unavoidable loss, and the writer has devised a method of estimating the water present, whether water of hydration—i.e., combined water or hygroscopic water—is present alone, or whether water is present in both forms. The pulp is distilled with toluol, and the first fractions of the distillate contain all the water originally in the pulp. Now the hygroscopic water is got rid of by drying below 100 deg. C., and the water of hydration remaining until that temperature has been reached and maintained for some time. Hence by comparing the results of the toluol test with the loss of weight on drying, the amount of each kind of water can be determined. The distillation with toluol lasts from 10 to 15 minutes, and it is necessary to allow the distillate to stand for a full hour before reading off the volume of the condensed water supernatant on the condensed toluol. Petroleum can be used instead of toluol, and is cheaper.

Although the method is primarily intended for use on pulp in which there is no visible water, the method can be applied to wet pulp, if we bear in mind that in this case we have to deal with mechanically adherent water, as well as with water of hydration and hygroscopic water.—Papier Fabrikant.

CANADIAN LUMBERMEN'S ASSOCIATION.

A meeting in Ottawa last month resulted in the organization of an important body, to be known as the Canadian Lumbermen's Association, somewhat similar in its aims to those of the National Wholesale Lumber Dealers' Association of the United States. It will watch closely all legislation affecting the lumber industry, provide a bureau of information for the members, etc. There will also likely be a department of transportation to look into freight rates; also an insurance branch. The Association elected the following officers: Honorary president, J. R. Booth, Ottawa; president, Gordon C. Edwards, Ottawa; vice-president, J. B. Miller, Toronto; treasurer, R. G. Cameron, Ottawa. The secretary, who is to be a permanent paid official, will be appointed later.

After the meeting the officers formed a deputation to the Government to ask them to impose a duty on Southern pine and hemlock imported into Canada.

TARIFF DECISIONS.

Appraisers' Bulletin, No. 276, of the Customs Department, gives the following decisions affecting the paper trade:—

Articles.	Tariff Item.	British Preference Tariff Rate.	General Tariff Rate.
Masks (false faces) of paper	199	22½%	35%
Masks (false faces) of papier mache	198	22½%	35%
Opaque envelope paper in colors, manufactured in one process	197	15%	25%
Plaster board made of layers of paper and plaster	192	15%	25%
Cabot's sheathing and deatening quilt, a sheathing paper consisting of two sheets of paper filled between with a layer of eel grass	192	15%	25%
Cabot's asbestos quilt, a sheathing paper consisting of two sheets of paper filled between with a layer of eel grass and coated outside with asbestos preparation	192 or 312	15%	25%
Keystone hair insulator, a sheathing paper consisting of two sheets of paper filled between with a layer of hair	192	15%	25%
Milk described as "powdered milk" or "dried milk," manufactured into the form of a powder from pure milk or skimmed milk	43	2 cts. per lb.	3½ cts. per lb.

SALE OF SULPHITE MILLS

Judical Sale by Tender of Assets of Northern Sulphite Mills of Canada, Limited

IN THE HIGH COURT OF JUSTICE

Pursuant to the judgment of the High Court of Justice for the Province of Ontario, in an action of Diehl et al. v. Johnston et al., and with the approbation of J.A.McAndrew,Esq., Official Referee, sealed tenders will be received up to twelve o'clock noon on the twenty-seventh day of August, 1908, by the receiver of the above company for the purchase of the following assets of the above company :—

(1) Sulphite mills situated at Sturgeon Falls, having the present capacity of twenty tons of sulphite, with a possible capacity of 70 tons per day when completed.

(2) The said sulphite mill is situated alongside of the Imperial Paper Mills of Canada, Limited, which latter mills, with the concession belonging to the said company, are also to be disposed of by judical sale.

(3) The highest or any tender not necessarily accepted.

(4) Tenders will be open by the Official Referee, J. A. McAndrew. at the office of E. R. C. Clarkson, 33 Scott Street in the City of Toronto, on the 27th day of August, 1908, at 12 o'clock noon, when all tenderers are requested to be present.

Terms of Sale—A marked check for $10,000 is to accompany each tender.

Upon acceptance of any tender, 10 per cent of the purchase price is tobe paid by marked cheque,and the balance thirty days thereafter.

In case of default by the purchaser, after notice, the receiver may declare the deposit forfeited.

After acceptance, the property is to be insured and premiums paid by the purchaser, and the property to be kept in repair by him, taxes and insurance to be apportioned as of the 27th day of August, 1908.

Possession will be given upon payment of the full amount of the purchase money.

The other conditions of sale will be the standing conditions of the court.

Full particulars of the mill can be had upon application to the receiver E. R C. Clarkson, 33 Scott Street, Toronto, Canada, or to Messrs. Royce & Henderson, Solicitors, Traders Bank Building, Toronto, Ontario, Canada.

WANTED

Copies of Paper Trade Journal for years 1897, 1898 and 1899. Will pay liberal price for single copies. Address JOHN NORRIS, Room 904, Pulitzer Building, New York City.

—There were no bids for the purchase of the plant of the Cornwall Paper Manufacturing Company, Mille Roches, Ont., and the sale, which was to have taken place on the 22nd ult., was postponed indefinitely. The mill is being run at a profit under direction of the Trusts and Guarantee Company, Toronto.

—The special number of "Der Papier Fabrikant," published on June 19th last, is a revelation of the typographical possibilities of our German friends. It contains no fewer than 280 pages, well printed, well illustrated, and on good

SALE OF PAPER MILLS AND PULP CONCESSION

Judicial Sale by Tender of Assets of Imperial Paper Mills of Canada, Limited.

IN THE HIGH COURT OF JUSTICE.

Pursuant to the judgment of the High Court of Justice for the Province of Ontario, in an action of Diehl et al. vs. Carritt et al., and with the approbation of J. A. McAndrew, Esquire, Official Referee, sealed tenders will be received up to twelve o'clock noon on the Twenty-seventh day of August, 1908, by the Receiver of the above company for the purchase of the following assets of the above company :—

Pulp and Paper Mills now in operation situated at Sturgeon Falls, Ontario, having a capacity of 60 tons of ground wood pulp and 50 tons of paper per day.

Pulpwood Concession, situated on the Sturgeon River and its tributaries, said to cover an area estimated at 2,750 square miles, and to contain upwards of 5,000,000 cords of pulpwood.

The Water Power and Water Rights belonging to and controlled by the said Company at Sturgeon Falls Ontario. This water power is said to have a present development of 6,500 h.p , and a possible development of 12,000 h p.

The successful tenderer will be required to purchase the mill stores and repair supplies and camp supplies on hand at the time of sale, amounting to about $60,000, at 65 cents on the dollar of the inventory valuation.

Tenders will be opened by the Official Referee, J. A McAndrew, at the office of E. R. C. Clarkson, 33 Scott street, in the city of Toronto, on the twenty-seventh day of August. 1908 at twelve o'clock noon, when all tenderers are requested to be present.

The highest or any tender not necessarily accepted.

Terms of sale :—A marked cheque for $10,000 is to accompany each tender.

Upon the acceptance of any tender, 10 per cent. of the purchase price is to be paid by marked cheque, and the balance within thirty days thereafter.

In case of default by the purchaser after notice, the Receiver may declare the deposit forfeited.

After acceptance the property is to be insured and premiums paid by the purchaser and the property to be kept in repair by him, taxes and insurance to be apportioned as of the twenty-seventh day of August, 1908.

Possession will be given upon payment of the full amount of the purchase money.

The other conditions of sale will be the standing conditions of the court.

Full particulars of the timber concession water power, mills and all other details can be had upon application to the Receiver, E. R. C. Clarkson, 33 Scott street, Toronto, Canada, or to Messrs. Royce & Henderson, Solicitors, Traders Bank building, Toronto, Canada.

paper. It is published by Otto Elsner, in Berlin, Germany, at Verlagsgefellschaft m. b h. S. 42.

—The Dominion Department of Mines is about to undertake some important experimental work in utilizing several large deposits of peat, for which purpose a plant will be established, probably at Ottawa. An expert will be brought out from Sweden to advise as to the various ways of using peat adopted in Europe.

WORKING UP WASTE PAPER.

The paper trade seems to be behind most otner branches of industry in respect of the utilization of its own waste products. If more use was made of waste paper there would be less cry about the exhaustion of pulp-making wood or rags. It is much to be desired that researches should be made as regards the usability of old paper. For example, let a ton of paper used once only be worked up and let the amount of new paper be recorded. Let this new paper be again used, and then worked up a second time to new paper, and let this series of operations be carried on to its economic or technical limit, whichever is reached first. It goes without saying that nothing must be added to the original ton, and that the observation of the results must not be confined to the weight of new paper got from the used stuff, but to its properties from every point of view, and also to the cost of the regenerating processes.

Anyone who attempts to utilize waste paper for making-pulp for new paper has to remember that the vast bulk of these papers are derived from old newspapers. It is impossible to get rid of the printing ink, one of the fastest pigments known, but there is no reason why old newspapers should not be employed in the manufacture of second-rate papers. Much will, of course, depend upon the nature of the paper on which the newspaper was printed. The paper used for halfpenny evening papers is very different from that employed in the production of the Times or the Telegraph, and may, perhaps, have served the same purpose before. What has to be done with these old newspapers is to work them into pulp, and then to observe the depth of the greyish color due to the distribution of the printing ink in the pulp. For certain kinds of wrapping paper the pulp can be used without change, regard being also had to the length of the fibre. The second working up, i.e., the tearing up of the paper in the devil, should therefore be regulated according to the nature of the old paper as well as to that of the product contemplated. With reference to the color, it may be mentioned that if wrappings or other brown colored paper of cheap quality are contemplated, the greyish color is of no importance. If, however, the printing ink color is in the way, it is at the same time possible to use the stuff economically by mixing it with white pulp of any kind so as to dilute the color. How far this dilution can be carried depends upon the special circumstances of the case, of which every papermaker is the best judge in his own practice.

In the case of written MSS. the case is somewhat different and less important. The quantity of MSS. coming on the paper market is naturally comparatively small, but we must remember that with this class of waste paper we have not to deal with ink of anything like the indelibility of printing ink. Waste MSS. is best treated with the usual methods for removing writing ink, whether iron ink or artificial dye ink, before any attempt is made to tear it up. It may then yield a white pulp requiring no bleaching.

We have as yet said nothing about obtaining from old papers substances which, unlike ink, can be used over and over again; such as the sizing and filling materials which separate when the paper is torn up for use again. We hope to speak of this part of the subject in a future article.

MIXTURE OF CRUDE AND BAKED LIME FOR PAPER-MAKING.

In describing a process introduced by M. Alfred Monin, the Revue de la Papeterie remarks that natural crude sulphate of lime, on account of its low price and its very white color, has up to the present been used as an admixture in wood pulp. The proportion retained in the pulp is, however, inconsiderable, the crude sulphate of lime forming in conjunction with the water a pulp with little thickness or bending power.

The admixture of baked natural sulphate of lime has had to be abandoned, because, through mixing with water, there is obtained relatively quickly (according to the degree of the baking) a hard substance and not a pulp. The difficulties attending its preparation make the price high for the white color desired in the article for use in paper manufacture.

These difficulties are avoided by using a mixture of the two kinds, which, separately, produce small or undesirable results. By a judicious and close mixture of the two substances a composition is obtained, which on the one hand does not harden in water like baked sulphate of lime, and on the other hand makes the pulp very thick and very unctuous. As it always remains pulpy it can be used in paper manufacture with a higher yield than is obtainable with its ingredients used by themselves.

Notwithstanding the precautions necessary for obtaining the desired whiteness, the price of the composition is such that it can be advantageously used to replace white talc and high grades of kaolin. The latter are often less white than the composition of sulphates of lime described by M. Monin.

While no absolute rule has been laid down, a mixture of one-quarter of baked sulphate with three-quarters of crude is reputed to be suitable for ordinary purposes.

CANADIAN PACIFIC SULPHITE PULP CO.

Ernest E. Sawyer, presiding at the second ordinary general meeting of the Canadian Pacific Sulphite Pulp Co., Limited, in London, said that while the company had not advanced as quickly as they had hoped, the directors had not lost an iota of their confidence in the future. Though inevitable delays had taken place, all the plant put down had exceeded anticipation, both as to capacity and economical working. The accounts of the company from June, 1906, to December 31st, 1907, show the following items: Debit—Issued capital (less calls in arrears, £3,739), £92,176; creditors, £3,061; total, £95,237. Credit—Property account, £31,500; buildings, plant, etc., £33,660; timber and stores, etc., on land, £8,906; debtors, £1,196; cash, £10,169; preliminary expenses, £4,346; development and management expense, after deducting profit on stores, etc., £5,460; total, £95,237. The directors have decided to create £65,000 six per cent. debentures, of which about half will be issued immediately. The proceeds of this issue are expected to complete the pulp mill and provide the funds for working it.

FIRE AT LINCOLN PAPER MILL.

St. Catharines, Ont., suffered a serious loss by fire on the 19th ult., when one of the mills of the Lincoln Paper Co., Limited, situated on the Welland Canal, at the city limits, was totally destroyed at a loss which will reach probably $50,000. It started in the machinery room, probably through friction. The men fought the flames pluckily for a while with the mill fire apparatus until the fire brigades of Merritton and St. Catharines could get there, but the fire spread with great rapidity. The flames had gained too much headway for anything to be done when the firemen got to the scene, and it burned itself out. The expensive paper machinery used is practically ruined.

D. Woodruff, president and general manager of the company, is at present in England, whither he went to look after the Woodruff succession dues appeal case. This is the second time the mill has been burned. Several years ago, when the mill was in a frame building, it was destroyed by fire, one man losing his life. There were about twenty men employed in the burned mill, the majority of the Lincoln Company's employees being at the larger mill, further up the canal. The company had almost closed a deal to take

over the Colored Cotton Co.'s mill at Merritton, which has been standing idle for a long time. This will enable them to greatly increase their capacity.

SMOOTH SURFACES ON PAPER BOARDS.

The Papier-Fabrikant remarks that almost all the boards made on long wire machines are more or less uneven and rough upon the upper side, the machines referred to being on the same general principle as paper machines, with such differences as the nature of the product calls for. It is further stated that this roughness of surface is more apparent in proportion to the thickness of the board.

In order to give such boards as even an upper surface as possible, it is recommended to bring the pulp on the wire containing a good deal of water, making the oscillations uniformly rapid and short, so that the water is retained as long as possible. With boards weighing 24½ ounces per square metre (1.19 square yard), 280 to 300 oscillations of about one-eighth inch per minute will, it is said, give a good result.

As to the temperature to which the pulp should be brought, it should depend upon the thickness of the board to be made and upon the character of the grinding. For a board of the weight referred to above the right temperature would be 50°C. (122° Fahr.).

WATERMARKING OF TISSUE PAPERS.

A paper maker contributes to the Papier Zeitung a short note on the manufacture of so-called Chinese tissues with watermarks. These tissues are made of long fibred soda or sulphate wood pulps, and do not retain sufficient water after passing the first suction box to take a clear impression from the dandy roll. The writer has arrived at a workable process for watermarking these thin tissue papers by taking away two of the register rolls which support the wire not far from the slices and placing the dandy roll between the deckle straps on the portion of the wire thus made vacant. It is also advisable to arrange a rubber cloth so that it runs with and underneath the wire and prevents the too rapid escape of the water; such a device is well-known to makers of tissue papers. Still it is possible to work without going to the trouble, but in that case the concentration of the pulp must be adjusted accordingly. In any case the manufacture of these watermarked tissues is attended by a large production of "broke" unless exceptional care and experience are devoted to it. For this reason orders are frequently refused in spite of comparatively high prices; as a specialty, however, there is a considerable profit in it.

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This old and tried friend of the Paper Industry is particularly useful in bringing paper, pulp and board manufacturers, paper merchants, wholesale stationers, paper bag makers, mill representatives, agents, exporters, paper makers, engineers, oil merchants, belt and machinery manufacturers, printers, chemical and color manufacturers, rag merchants, waste paper and paper stock dealers, cardboard and paper box manufacturers, china clay and fibre merchants, felt and paper machine wire manufacturers, etc., etc., into touch with one another. The new edition for 1908 (cloth bound, 720 pp., 10s. 6d. net), is now issued and shows that to the book have now been added, British Paper Trade Customs, Size and Folds of British Papers, etc. Owing to its international character, the book is sure to be of interest to readers in every branch of the paper and allied trades, giving as it does particulars of some 4,000-5,000 mills, scattered throughout 40 different countries. It is published by Dean & Son, Limited, 160A Fleet Street, London, E.C., England.

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A1 on Book, Bond, Blottings and Coating Stock 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc. Address M. R. J. care Pulp and Paper Magazine, Toronto.

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THE MARKETS.

Toronto, July 18th, 1908.

General business conditions seem to be slowly improving, and many believe that with the present great promise for good crops coming to fruition in the fall business will be on almost a normal basis again by that time. The paper trade, while as yet of comparatively small volume, is generally looked on as being upon a strong basis. Prices keep firm, and, as a rule, there has not been much cutting. News print can be had around $2, though the general quotation would be nearer $2.10. The better grades of paper are where the chief weakness has been felt, a good deal of writing having come in from the United States at low prices. Pulp of all classes is not in active demand and values are easy. Quotations are scarcely on a sufficiently steady basis to be in order.

British.—Mechanical pulp for next year's delivery is firm, with a fair amount of business passing. According to "World's Paper Trade Review," the chief feature is the extraordinary low prices at which soda pulp, perhaps job lots, are being offered for early shipment. A quiet tone prevails in chemicals. Bleaching powder (soft wood), is quoted at £4 2s. 6d. to £4 5s.; ammonia alkali, 58 per cent., £4 15s.; caustic soda, 76-77 per cent., £11; soda crystals, £2 17s. 6d.; salt cake, £2 2s. 6d.; recovered sulphur, £5 to £5 5s.

—Owing to the business depression necessitating a reduction in the cost of manufacture, the International Paper Co. will probably make a general cut in wages at all its mills shortly. Dividends have already been reduced.

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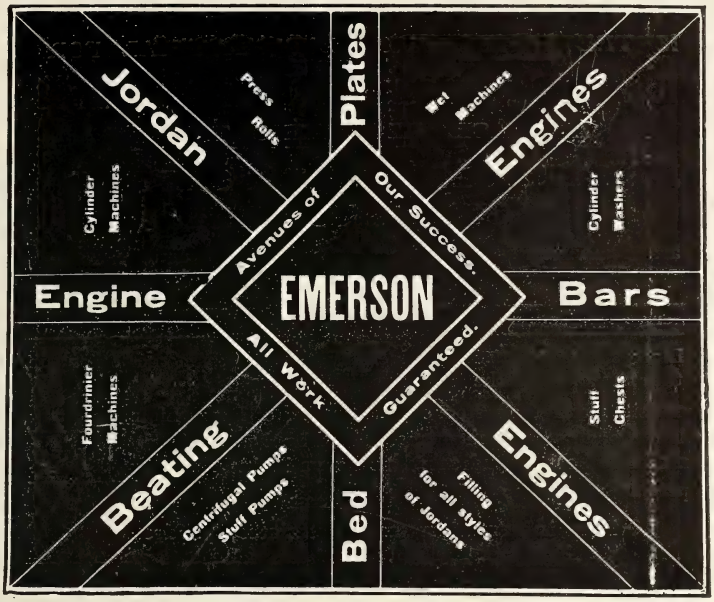

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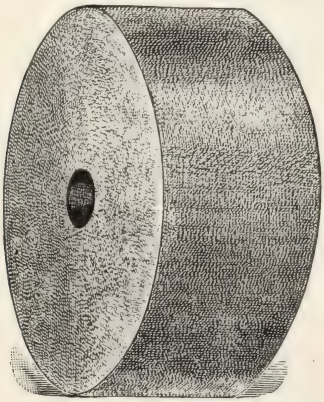

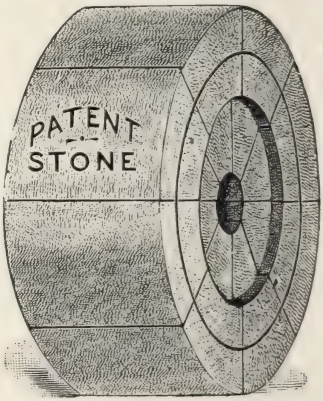

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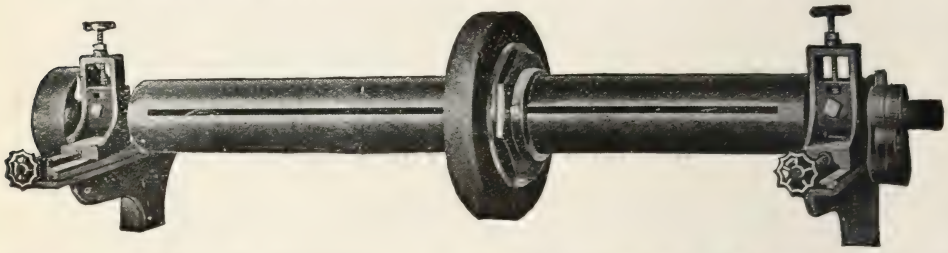

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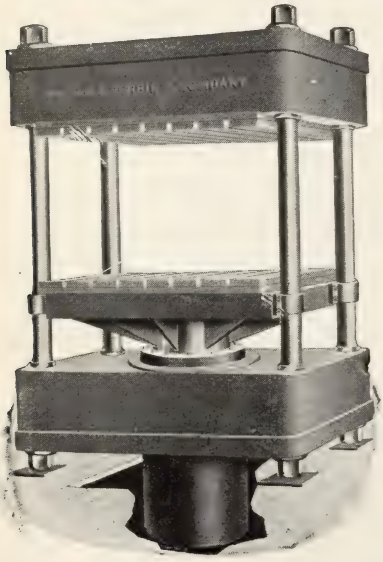

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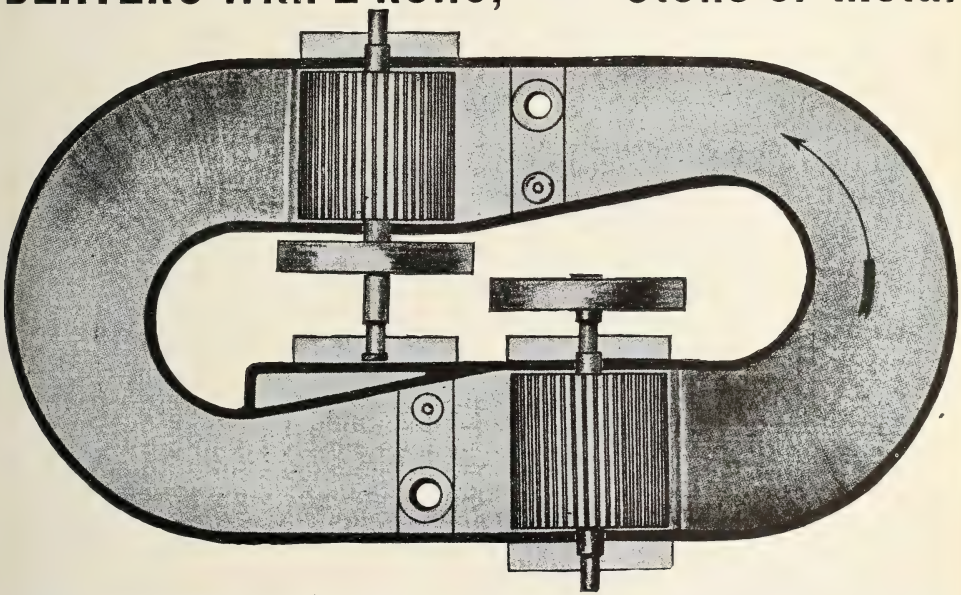

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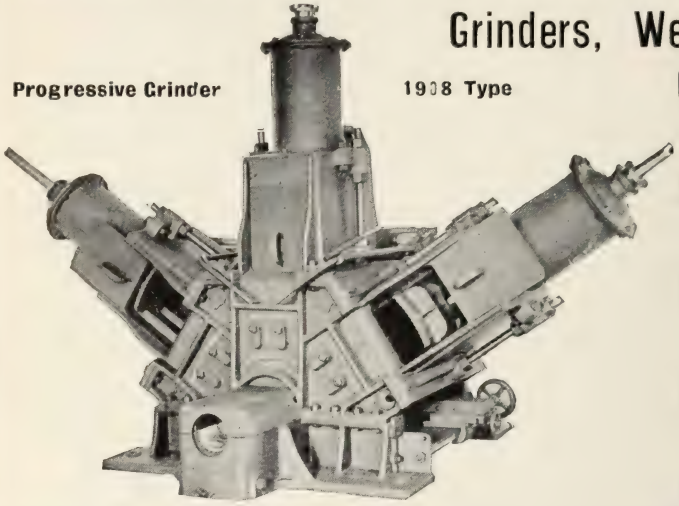

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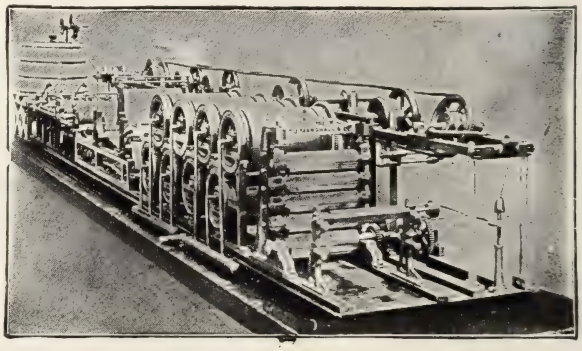

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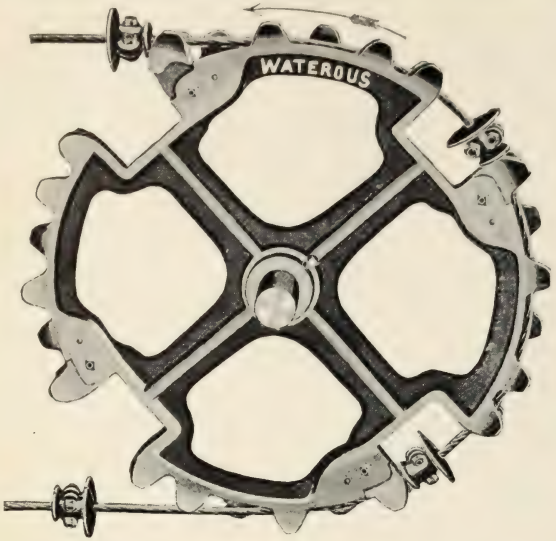

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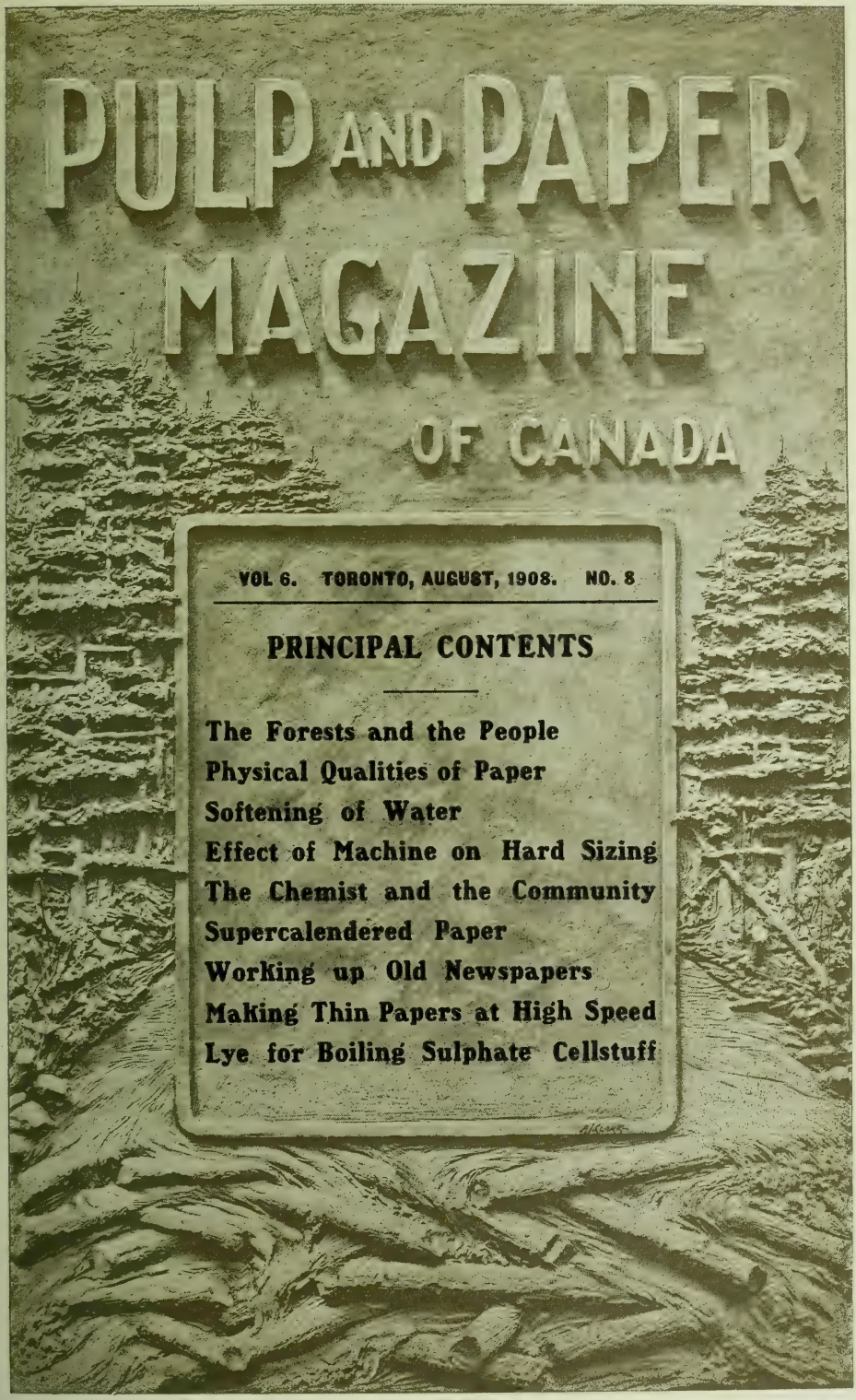
PULP AND PAPER
MAGAZINE
OF CANADA
VOL 6. TORONTO, AUGUST, 1908. NO. 8
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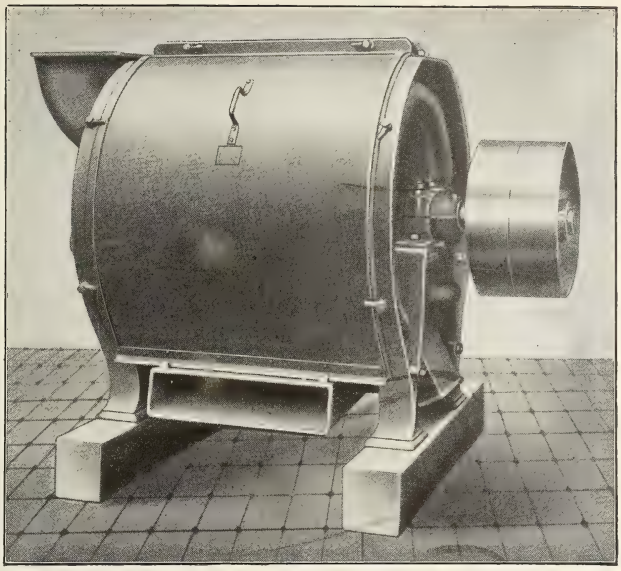

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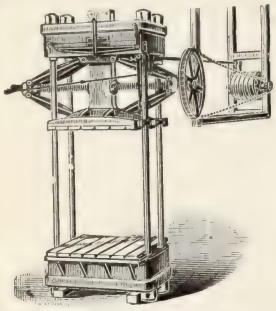

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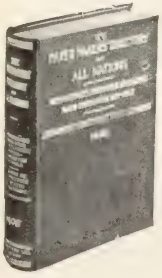

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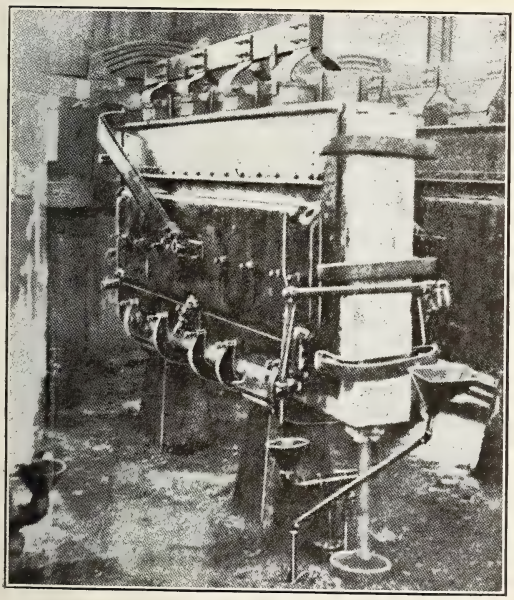

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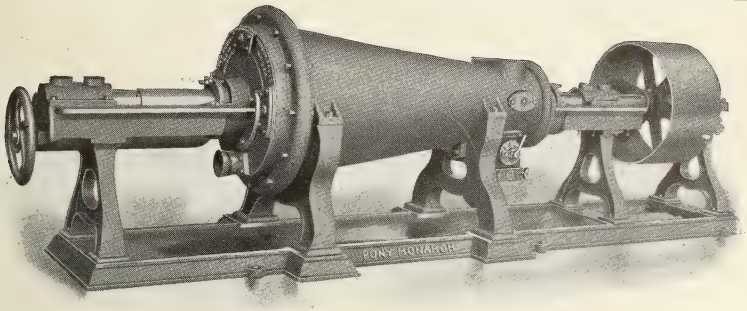

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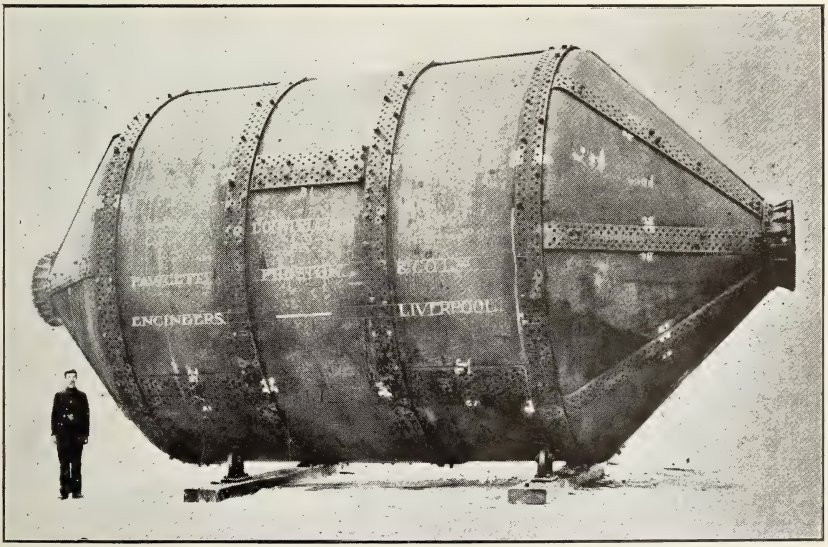

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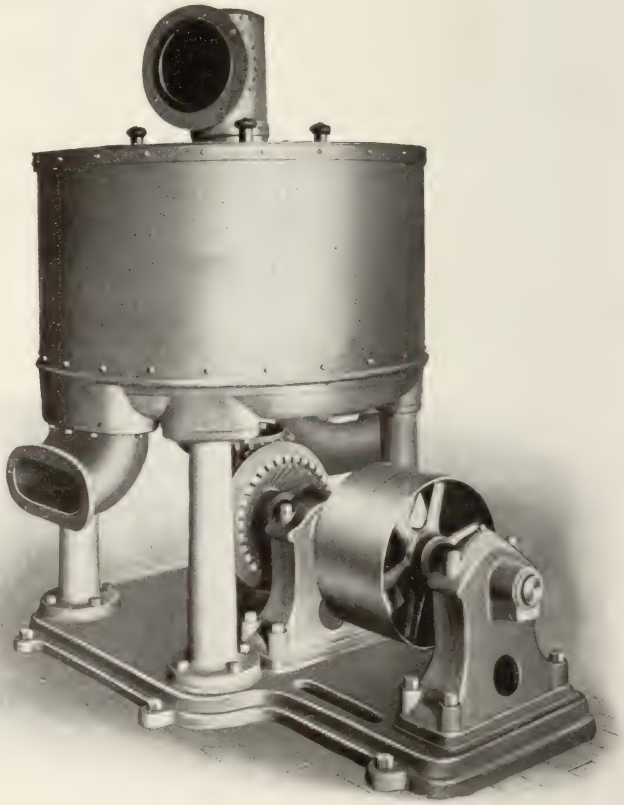

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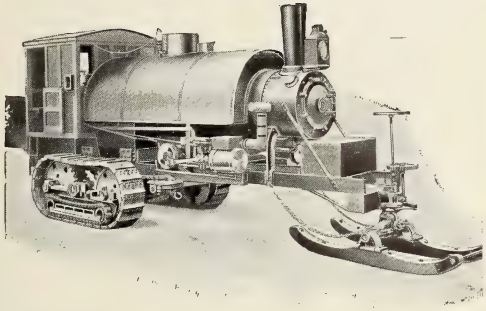

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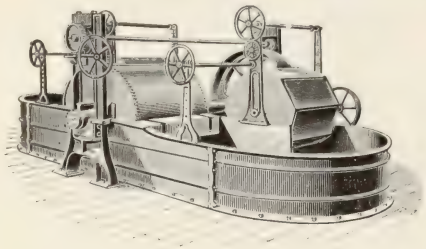

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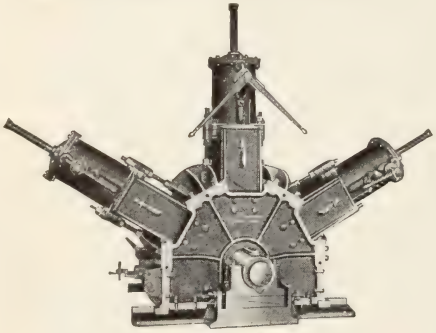

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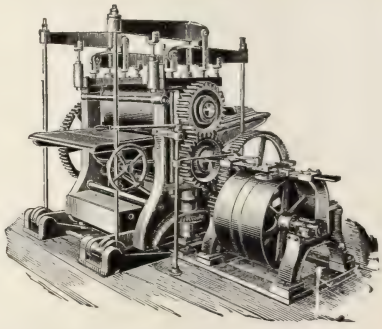

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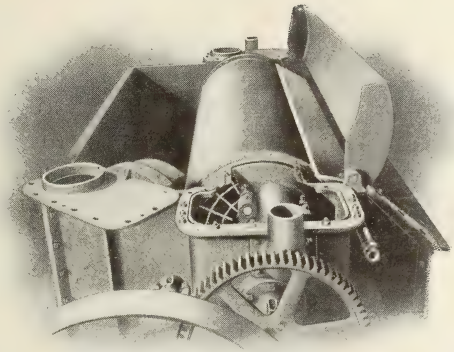

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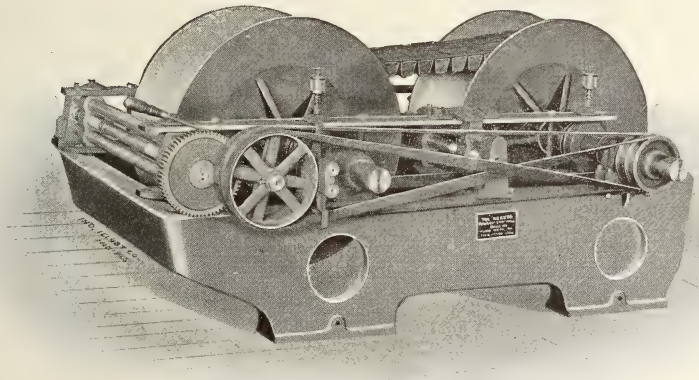

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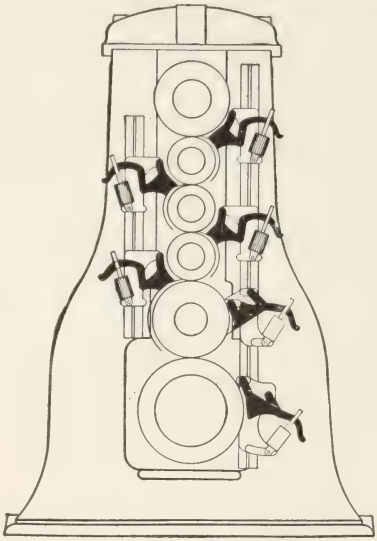

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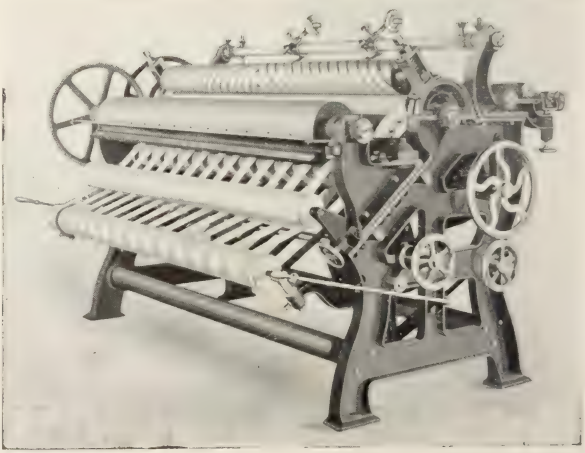

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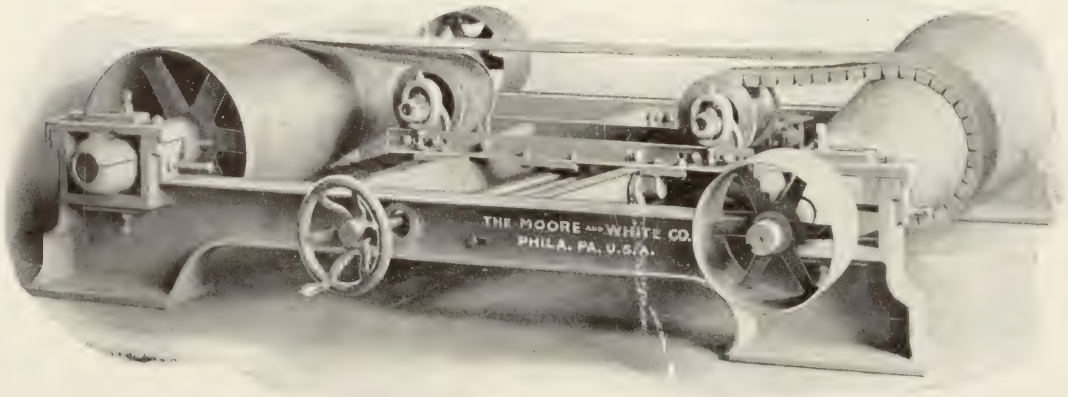

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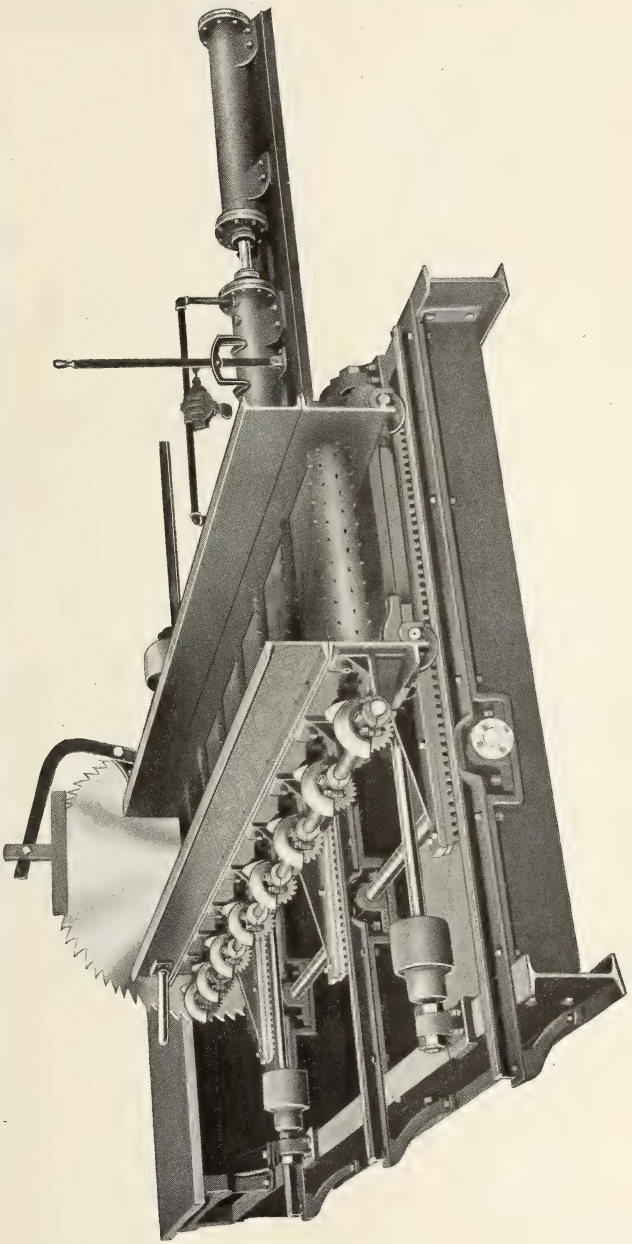

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THE
PULP AND PAPER MAGAZINE OF CANADA

Vol. 6.—No. 8. TORONTO, AUGUST, 1908. $1 A YEAR / SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

SUBSCRIPTIONS: Canada and British Empire, $1.00 per year; United States and Foreign, on account of postage $1.50 per year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

BIGGAR-WILSON, Ltd.,
PUBLISHERS
OFFICES, CONFEDERATION LIFE BUILDING,
TORONTO, CANADA.

THE FORESTS AND THE PEOPLE.

Not only those directly engaged in industries depending on the forests, but every far-seeing Canadian who realizes to what an enormous extent the whole future well-being of our country depends upon the conservation of our natural forest resources will sympathize with the extra great efforts now being made by the Canadian Forestry Association to bring these truths home to the masses of the people. It is acting on the indisputable assumption that every Canadian has a share in the ownership of Canada's forests. Self-interest, no less than duty, imposes upon him a share in the duty of wisely using these forests.

A forest is not merely a place where wood is grown, but it is also the source and regulator of the immense water-powers which are our national pride, and which, when taken in conjunction with our great stores of raw material and our splendid transportation system, must make the Dominion, from now on, a great manufacturing country. Yet the average Canadian does not realize that his country's "inexhaustible forest resources" are in great danger of being exhausted in the very near future.

A far-sighted, comprehensive, aggressive and business-like public policy in relation to our forests is one of the great needs of the time. Our leading statesmen and political economists recognize this fact, and an ever-increasing number of thoughtful people are urging the Federal and Provincial Governments to introduce a sweeping forestry policy. Such a policy can be evolved and carried out only through the creation of a widespread public intelligence on this vital subject.

The Canadian Forestry Association is striving to make our people understand the serious consequences of forest destruction and to arouse an interest in the problem to an extent that will result in vigorous and speedy action looking to the preservation and wise use of our forest wealth.

With these objects in view the secretary of the Association, A. H. D. Ross, of the Faculty of Forestry, Toronto University, is issuing a pamphlet under the title of "The Forests and the People," which treats of some of the more important aspects of the subject in a popular way. And this it does in such a strikingly able manner that we have no hesitation in recommending every reader to apply for a copy. The following is an extract from this book:—

"The forestry movement should appeal to all Canadians. Canada has been blessed by Providence with a wealth of forest. It has interwoven itself in her poetry and her history. It clothes with beauty her sterile lands, making them productive, and giving healthy occupation to a happy people. In the advance of the civilization of the nineteenth century two-thirds of this forest has been swept away by fire, uselessly and needlessly. Rocky and sandy wastes have been bared and left desolate. Is this all the intelligence of man can do? Has the twentieth century no other purpose to accomplish? Will the close of another cycle find the destruction much more surely and completely established? Or will the expiration of another hundred years find the forests clothing the rocky hills and valleys with their beautiful verdure, well-ordered, productive, abounding in wealth for the State, furnishing the needs of Canada and the regions beyond, supporting a hardy and intelligent populace, forming a shelter for the wild animals and a place of pleasant resort for the people?"

Besides this, there is the allied question of the preservation of our waterpowers, taken up in another part of the same pamphlet.

Gifford Pinchot, chief of the United States Forest Service, Washington, is issuing a circular on "What Forestry Has Done." Its pages show that by far the most successful forestry in the world is that of Germany, where the woods are treated as among the most important assets of the Empire, to be controlled by a staff of experts, who cut trees only when they are worth cutting, always planting a seedling when a tree is felled.

Let us take Prussia as an example of forestry at its best. In 1830 the yield was 200 feet, board measure, per acre; in 1865, 240 feet; in 1890, 520 feet; and in 1904, 650 feet. During the seventy-five years thus recorded, the quality of the product steadily improved, the percentage of saw timber increasing nearly threefold. Measured in money, the results are even more gratifying. In 1850 the net return was 28 cents per acre; in 1865, 72 cents; in 1900, $1.58; and in 1904, $2.50. Of course, the rise in prices accounts for a good deal of this increase of profit. At $2.50 an acre, five per cent. income is yielded on an investment of $50 an acre as capital. For any other crop but trees the most of the woodlands would be valueless. When we learn that the Prussian forests cover an area of seven million acres, it is clear that the Germans are handsomely paid for bringing forestry to the level of an exact science.

Dr. B. E. Fernow put the case for forestry well and tersely when he said at a meeting of the Association:—

"We have been talking for twenty-six years on this subject of a probable timber famine, and some time ago I was

asked where was that predicted timber famine. I said: "You have been asleep; it is on us already, for when prices rise continuously at a rapid rate there must be a famine." Not an absolute absence of material, but an increase of prices makes a famine; and the prices have risen very steadily, as you see.

"This more or less horizontal line," referring to a diagram exhibited at the meeting, "indicates the prices before 1899, while this rapidly ascending curve represents the prices since that year, and from the character of the curve you can see that this rise in prices will go on, as may also be predicted from other data, I assure you. Every year you pay just eight per cent. more for your wood than you did the year before. Have you no interest in that? I mean has the public in general no interest in the forestry question? It seems to me they have. Everybody must have an interest in it, because it touches his pocket.

"Not supply and demand, but knowledge of supply and demand makes prices, and the trouble has been in the past the absence of knowledge as to our timber resources, and this lack of knowledge still works against our work of reform. During the last few years the knowledge has increased and the result has been that prices have risen as it became known that the supply was less than had been supposed.

The data refer more especially to wood for lumber, but practically the same conclusions may be obtained from a study of the problem from the pulpwood point of view.

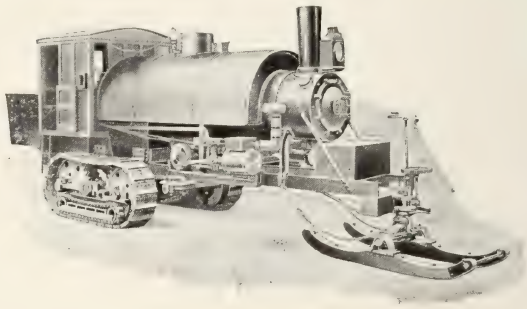
THE LOMBARD STEAM LOG HAULER.

The main idea underlying the use of the Lombard Steam Log Hauler, illustrated herewith, is that it represents the application of steam power to lumbering operations in the woods. Since this is a radical departure from existing methods long in vogue, the significance of the Lombard Steam Log Hauler is not grasped instantly, but when it is reflected what great strides have followed in other industries upon the supplanting of man power or horse power by steam power, the possibilities in the way of economy, increased earnings and more extensive lumbering operations by using the Lombard Steam Log Hauler become apparent. A glance at the cut will show that the Hauler consists of a portable boiler, locomotive type mounted on a reinforced channel iron frame, extending from extreme front end to rear of machine and supporting cab and coal tender, the water tank, with a capacity sufficient for a five mile run, being carried on top of the boiler, saddle fashion. The channel iron frame in turn is supported by the heavy traction wheels in rear and sled in front. The boiler is 15 feet in length, 35 inches diameter, has good generous fire box, and is built to stand a working pressure of 175 lbs. to the square inch. It is adapted to burning either wood or coal. The barrel of the boiler is heavily jacketed with non-conducting material held in place by Russia iron lagging. The flues are 1¾ inches diameter and the boiler is an easy steamer. The engine is of the duplex pattern, cylinders 9 inches diameter, 10-inch stroke, and the engine beds are specially designed for bolting to the channel iron frame. The engine is equipped with link reversing motion and the design throughout has been carried out with the idea of securing utmost simplicity of parts, strength and durability. The traction device consists of two heavy cast iron runners one on either side of the engine. In boxes on each

end of these runners are fixed the special sprockets carrying the steel lag chains, which are the prime feature of the entire machine. The "links" are steel castings, 16 inches wide, 2 inches thick. Running on the back of the links on the tread are steel roller chains one being inside and one outside the sprockets. These roller chains run on cast iron frames attached to the runners and their office is to keep the lag chains flat on the tread regardless of uneven spots in the road. Power is transmitted from the engine to the traction device by means of a compensating gear, fixed on a divided counter-shaft running in a yoke or frame bolted to the lower side of the channel iron frames. By means of this divided counter-shaft uneven strains on the driving mechanism when turning sharp curves and the like are taken care of. From the counter-shaft to sprockets on the same shafts as the rear sprockets, carrying lag chains, the power is conveyed by a special sprocket chain, extra strong.

The cab is fitted up in usual locomotive style, each engine having quadrant and lever for reversing, and customary locomotive fixtures are furnished. The Log Hauler weighs 15 tons without water, and about 18 tons ready for the road. With 175 lbs. steam pressure, the engine develops about 100 horsepower and the Hauler has a speed of from four to five miles per hour. While it will work in very rough country, and to much advantage, to obtain best results, easy grades should be maintained and long easy turns as possible. Provision for water should be made every four or five miles, and if it cannot be obtained, extra tank has to be carried for this purpose. Where roads are well graded and iced, these engines will handle from 7 to 15 heavy logging sleighs, with 5,000 to 7,000 feet of logs to the sled. These sleds are of extra heavy pattern, specially made for the purpose. Several engines are making fifty miles per day and doing the work of anywhere from twelve to eighteen 4-horse teams. Where very long roads are to be encountered the Lombard Hauler can be run day and night by changing crews. There are three men to the crew, engineer, fireman and pilot.

The Lombard Steam Log Hauler is



used extensively already in the United States and will no doubt spring quickly into favor with enterprising Canadian lumber operators. It has been fully patented in the Dominion by the inventor, A. O. Lombard, of Waterville, Me., and the Canadian manufacturing and selling rights have been secured by the Jenckes Machine Company, Ltd., Sherbrooke, Que. Not only can the Lombard Hauler be made a money saver in lumbering operations proper, but also it is necessary to haul logs, timber, pulp, or in fact any commodity in large quantities upwards of four miles, from mill to mill or from mill to point of shipment as the case might be. By replacing the forward sleds with a pair of wheels, the Lombard Hauler can be used equally well on summer roads.

PULP AND PAPER NEWS

T. D. Nuttall, one of the directors of Bentley & Jackson, Ltd., Paper Makers' Engineers, Bury, Eng., is on a visit to Canada and the United States.

* * *

The Harmsworths have bought large coal beds in Cape Breton, with a view to supplying fuel for their large pulp and lumber mills in Newfoundland.

* * *

Among the powers granted to the Crown Lumber Company, Ltd., recently incorporated under British Columbia Act, is to do business as manufacturers and dealers in wood pulp.

* * * *

Forest fires in the vicinity of St. Elie d'Orford, near Sherbrooke, P.Q., assumed serious proportions and reached 900 cords of pulp-wood which were destroyed. In immediate vicinity of the fire were some six thousand cords of peeled wood.

* * *

The King Paper Box Company, Montreal, has been granted a Dominion charter authorizing it to manufacture and sell paper, cardboard and wooden boxes, and do a printing business. Capital stock autnorized is $49,500. O. Constantineau and J. H. Lefebvre, of Montreal, are interested.

* * *

The Etchemin River Lumber Company, Sherbrooke, P.Q.; capital, $10,000, recently incorporated under Quebec charter, is authorized to manufacture pulp and paper. F. L. Farmer, of Three Rivers, P.Q.; and J. E. W. Levesque, of Sherbrooke, are members of the company.

* * *

The Skiminac Land and Lumber Company, of Lewiston, Maine, recently organized in Maine, with R. D. Hastings, of Auburn, Me., as president, will shortly begin operations in pulp-wood and lumber cutting on its large newly-acquired limits in Bonaventure County, P.Q.

The Nicolet Falls Pulp and Lumber Company, Danville, P.Q. capital stock, $150,000, has been authorized under Quebec charter to manufacture pulp, paper and lumber. E. W. Tobin, of Bromptonville, P.Q., and B. Quinn, of Windsor Mills, P.Q., are members of the new company.

* * * *

John M. Poole, president of the Poole Publishing Company, Toronto, publishers of subscription books, etc., disappeared last October after the failure of his company. Being wanted on a charge of fraud preferred by the Farmers Bank, he was eventually located a week or two ago in New York.

* * *

Large quantities of Canadian wood pulp have arrived lately in Manchester, amongst which was an entire cargo by s.s. "Nordamerika," from Montreal. This steamer, of about 4,500 tons d.w. capacity, brought 21,200 bales wet and 12,158 bales of dry wood pulp. The steamer was chartered by A. Wertheim & Company, Hamburg. Further large parcels of Canadian wood pulp are reported to be on the way to England.

* * *

About $20,000 worth of pulp-wood on Lake Temiskaming, which was to have been delivered by H. A. Fraser to J. R. Booth, of Ottawa, was seized by Gillies Bros., who claimed that the former owed them that sum for tolls and trespassing on their spruce limits. Mr. Booth, in order that his pulp mill might not be hampered in its operations for want of wood gave bonds for $20,000 pending the decision.

* * *

Fritz A. Poehle, for fifteen years confidential clerk of the Barber & Ellis Company, wholesale stationers, Toronto, disappeared on July 6. He was traced to Niagara Falls, N.Y., but all clues were lost until July 12, when his body was found in the water above Niagara Falls, with a bullet hole in the right

temple. An examination of his books showed there was no shortage, and it is believed the excessive heat caused him to go insane.

* * *

Reports to hand last month in Ottawa stated that one of the most disastrous forest fires in the history of the Ottawa Valley has devastated a large area of valuable spruce and pine timber limits along Lake Nipissing and the Montreal River. Among the losers are J. R. Booth, the Shepard & Morse Company and Miller Bros., and it is stated that nearly 150,000,000 feet of timber were destroyed. Ottawa lumbermen says that more stringent regulations should be adopted to prevent forest devastation by fire through the carelessness of mining prospectors in New Ontario.

* * *

J. E. A. Dubuc, general manager of the Chicoutimi Pulp and Paper Company, stated in an interview recently that the Chicoutimi and Ouiatchouan Pulp Companies were now very busy on exportations, and were actually shipping, from Chicoutimi and Quebec, between 16,000 and 17,600 tons of dry weight pulp monthly. By one line of Danish vessels, plying between Saguenay ports and Liverpool, 12,000 tons per month went out in three vessels. One English vessel making monthly voyages on the same route carries 4,000 tons more, while each of the C.P.R. "Empresses," sailing from Montreal bimonthly, carries 500 tons of dry weight pulp. Besides this, a French contract of somewhat smaller volume is being filled by direct shipment to Havre.

* * *

The well-known and old established wood pulp firm of Becker & Company, London, Eng., is being converted into a joint stock company. It has the reputation of being the largest pulp importing firm in the world, and has been wonderfully successful. Profits during the past five years have aggregated £57,612, or an average of £11,522 per annum. Subscriptions were recently opened for an issue of £50,000 5 per cent. first mortgage debenture stock at par, of which the vendors have underwritten and will take $25,000, and of £35,000 7 per cent. cumulative preferred ordinary shares at par of which the vendors will take £17,500. The debenture stock will carry interest at the rate of 5 per cent. per annum.

—Several of the International Paper Company's paper mills in New England and New York States have closed down owing either to strikes or to threats of strikes. The close down will be taken advantage of to do necessary repair work. A cut in wages amounting to 10 per cent. had been proposed. In Niagara Falls, N.Y., 750 men are out, and in Watertown about 400.

—A few days ago John Norris, chairman of the Committee on Paper of the American Newspaper Publishers' Association offered at auction, in accordance with advertisements to that effect, 100 tons of newspaper. The results however, were seemingly disappointing, for there was only one bid, which was $1.90 per hundred, made by Mr. Norris' assistant, at which price five carloads were taken for shipment to Texas.

—Bulletin No. 7 of the Sandy Hill Iron and Brass Works, Sandy Hill, N.Y., describes their Single Drum Winder and Slitter, designed for use with machines making paper up to 120 inches wide. The idea is to have a winder which will operate continuously. In this design all that is necessary is to slide the bottom slitters to the front side of the machine, on the shaft, place a support under the shaft behind the slitters and remove two bolts from the front box when the box can be removed, leaving an opening in the frame large enough to slide out the slitters without changing the adjustment. The advantage of the new machine compared with the old is very marked.

NEWS OF THE MILLS

The Miramichi Lumber Company's new rossing mill in Chatham, N.B., is now in operation.

* * *

J. R. Clarkson, manager of the Edward Partington Pulp and Paper Company, St. John, N.B., has recently returned from a trip to Europe.

* * *

Work was started soon after the fire at the Lincoln Paper Mill, Merritton, clearing up the ruins, which gave employment to a number of the hands working there.

* * *

James Beveridge has about completed the building for the new pulp mill at Millerton, N.B., and has begun putting in machinery. It will probably be some time yet before operations actually begin, however.

* * *

The Upper Ottawa Improvement Company reports the drive of logs much increased on account of the large cut of pulp-wood on the Montreal River required by J. R. Booth for his new sulphite mill. For other purposes the supply required is not diminishing.

* * *

J. R. Booth's new sulphite mill at Ottawa is almost completed. Its capacity will be about 70 tons per day, and it will employ about 60 men. Mr. Booth will now be able to make all kinds of paper out of the products of his own mills instead of buying sulphite pulp at Sturgeon Falls and elsewhere as heretofore.

* * *

The Edward Partington Pulp and Paper Company, St. John, N.B., are putting in a new pulp bleaching process after an Austrian model. For this purpose they are installing six large double cement vats, each capable of holding 6 tons of pulp. This plant is the only one of its kind on this continent. It is expected to be ready for operation about the end of October.

It is announced by the Industrial Department of the Canadian Pacific Railway that three large new pulp and paper mills are likely to result as the outcome of its negotiations with leading United States capitalists. The mills would be located within a short distance of Montreal. Sir William Van Horne is understood to be personally interested in the scheme.

* * *

The St. Catharines Standard of Aug. 1st said: "It is understood that to-night the sulphite department of the Riordon paper mill will close down for another period, the length of which cannot be guessed at. It is hoped by all, however, that it may not be for long, for when Riordon's is closed down it means the throwing out of work of a large number of Merritton men."

* * *

The St. John Pulp and Paper Company recently made application to the city of St. John, N.B., the owners of the Maspec mill, for a reduction of their annual rental from $3,500 to $2,500, owing to the poor condition of the buildings. Several aldermen thereupon visited the mill. Some of them are said to be in favor of the city selling the property.

* * *

La Compagnie de Pulpe de Dalmas, Quebec City, has been granted a charter to own and operate pulp, pasteboard, and paper mills and to purchase timber limits and water powers on the Little Peribonca River. Among the members of the new company, which has an authorized capital stock of $140,0000, are F. X. Drolet, Jos. Samson, A. E. Vallerand, E. Leclerc, G. Proteau, and A. Robitaille, all of Quebec.

* * *

The Humber River Pulp and Lumber Company, Ltd., of Deer Lake, Newfoundland, has through George W. Knox, of Niagara Falls, sold its large holdings to a Michigan syndicate, headed by H.

G. Bykhouse, of Grand Rapids, Mich. The property consists of 415 square miles of timber. The amount paid is not disclosed. The deal includes, besides the timber holdings, the lumber mills, the boats and other property of the Humber River Company. On the property are large quantities of spruce.

* * *

The Imperial Wall Paper Company, Glen's Falls, N.Y., are about to erect in Montreal a large factory to look after their Canadian trade. The company is one of the largest in its line in the United States, and is already doing considerable business in this country in spite of the 35 per cent. duty. Tynan S. Marshall has been in Montreal for some time past looking for a suitable site, and when this is obtained building will be started at once so as to begin manufacturing before winter if possible.

* * *

Welland D. Woodruff, president of the Lincoln Paper Mills Company, St. Catharines and Merritton, Ont., returned early this month from a month's trip to Europe. In the meantime he had been nominated as candidate as Liberal member for Lincoln County, in the next Dominion elections, and great enthusiasm was shown at his reception, not only by his supporters but by all the citizens of Merritton, with whom Mr. Woodruff is deservedly popular. There has never been a strike at the Lincoln mills, the understanding between the management and the hands being particularly cordial.

"WOOD PRODUCTS."

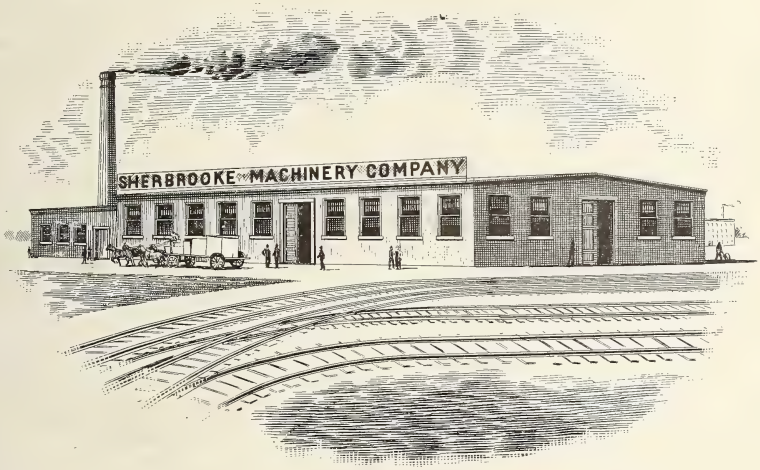
We have received a book entitled "Wood Products: "Distillates and Extracts," by P. Dumesny, chemical engineer, etc., and J. Noyer: translated from the French by Donald Grant. It contains 320 pages and possesses the useful addition of numerous illustrations and tables. Part I., under the general heading of Wood Distillation treats of the varieties of wood used in the wood distilling industry, the principal products of carbonization, distillation of sawdust, cost of production, manufacture of acetates, wood tar, etc.; secondary products of distillation; analysis of raw materials and finished products, etc. Part II. deals with the manufacture and testing of tow wood extracts and their utilization in modern tanneries, the plant and equipment required for treating chestnut wood; extract factories, tanning of leathers, analysis of various tanning extracts.

The book, which we draw to the attention of all those interested in the products of wood distillation—and in this country the subject is one which will doubtless prove of increasing interest—is published by Scott, Greenwood & Son, 8 Broadway, Ludgate Hill, London, at 10s. 6d. net; post paid for 11s. 6d.

—Messrs. Jebb Bros., Ltd., of Newcastle-on-Tyne, are known all over the world as being among the biggest packers of Manilla and Jute Fibres, and other Paper Stock. They have at the present time a large business in Canada and the United States, which they wish to increase. With a view of doing this, their Mr. T. H. Jebb took a trip to this side of the water, and while in Toronto closed an arrangement with Mr. G. A. Howell to act as their sole representative in Canada and the following states:—Pennsylvania, New York, Maryland, New Jersey, Connecticut, Massachusetts, Vermont, New Hampshire, Maine, Delaware, Rhode Island, and District of Columbia. Mr. Howell is now arranging to make his first trip over the territory, and will shortly hope to have the pleasure of calling on the buyers connected with the various mills. He will at the same time solicit orders for his various lines of Ground Wood and Sulphite, also any Pulpwood business which may be offered. Mr. Howell has only been in the business for a comparatively short time, but has already been able to establish quite a connection among the paper mills in the above mentioned territory, and should be very successful with his new arrangement.

SHERBROOKE MACHINERY COMPANY.

The accompanying cut represents the fine plant which the Sherwood Machinery Company are building in Sherwood, P.Q. This company was organized to build paper machinery in Canadian territory and under Canadian patents, and also to execute general work on miscellaneous mill machinery. It is expected to be ready for active work early this month. Orders now in hand for pneumatic save-alls and the company's other special machinery will be filled by September first if all goes well.



The company will handle in Canada the splendid group of paper machinery specialties made in the United States by the Improved Paper Machinery Company, of Nashau, N.H., in addition to a quantity of distinctively Canadian machinery. The pneumatic save-all is now in extensive use throughout the prominent paper mills of the United States and has proved itself to be of extraordinary service in saving from 75 per cent. to 90 per cent. of the waste fibre in white water and in doing this regularly, continuously and automatically. The saved stock, first drawn on to a revolving cylinder mould by suction, is held thereon and partially dried by the same pneumatic mechanism, forming a film. At this stage the film is blown off by a light blast of air passing out through the cylinder cloth and is laid upon a deflector plate. This remarkable, but simple, action serves not only to yield a continuous supply of perfectly good stock, but keeps the screen from fouling or clogging, delivers the stock at once for immediate use or storage and prevents any strain coming upon the screen, so that the screen wears much longer and may be much finer mesh than in older forms of saving devices, such as the feltless wet machine or decker. The aggregate saving now made by the several hundred of these machines in use represents a vast amount of money and the machine has demonstrated that it is just as important and more easy to save paper waste than it is to save the ores previously wasted in mining operations. The amounts saved actually turn the scales from loss to profit in some cases.

THIN PRINTINGS.

Thin print papers are of special interest for book purposes, and are usually made from a mixture of from 20 to 30 per cent. of chemical pulp with from 75 to 80 per cent. of hot ground mechanical pulp made from fresh pine

wood. The manufacturing process is a very complicated one, and the greasiest fine mechanical pulp must be combined with the best quality of chemical pulp to secure anything like satisfactory results. The chemical pulp which answers best is that prepared by the Mitscherlich process. Too much importance cannot be attached to these points. For the preparation of the mechanical pulp the grindstones must be made of the finest grained stone procurable, and only good and perfectly sound wood is admissible. The wood should be sorted, and all rotten or defective parts cut out. The use of cheap grindstones and bad wood is a very "penny wise and pound foolish" policy. —Zentralblatt.

CHINA CLAY SUBSTITUTES.

Plaster of Paris is much cheaper than china clay, but no one has hitherto thought of using it in paper filling, as it has the trifling drawback of setting hard in water. M. Alfred Monin has patented in France a method whereby sulphate of lime can be used for paper filling. He has discovered that if the dry plaster is ground up with unburned gypsum in suitable proportions, a filling is obtained superior in whiteness to the best kaolin, and never hardens or even stiffens. The mixture of unburned gypsum and plaster of Paris serves also as an excellent pigment for painting finished paper, and also as a vehicle for dyes, as it forms with them lakes of perfectly satisfactory fastness to light and air, even with comparatively loose artificial coloring matters.—Paper Making.

UNINFLAMMABLE GLAZE FOR PAPER.

A preparation having the same gloss as celluloid, but uninflammable, is made as follows:—One hundred grammes of shellac are dissolved in sufficient alcohol, and 20 grammes of collodion are added.

The resulting viscous liquid is applied to a sheet of glass of the same dimensions (width at least) of the paper to be coated. The paper is first surfaced with an adhesive of the following composition:—Water, 1,000 c.c.; glycerine, 5 c.c.; gum lac, 30 grms.; borax, 40 grms.; formalin, 2 c.c. Thus prepared the paper is laid face downward on the layer of composition on the glass, and is rubbed or rolled into contact. After having been left long enough to become dry, the paper is detached from the glass by the ordinary means, and will be found coated with the glaze. An addition of 100 grms. of gelatine can be made to the adhesive.—Rev. Prod. Chim.

—The British-Canadian Woop Pulp and Paper Co., have applied for the franchise to light by gas the municipalities of North Vancouver, South Vancouver, Point Grey and Burnaby. The gas which they propose to supply is entirely a by-product of the manufacture of wood pulp, and it is stated that they are able to secure from 12,000 to 25,000 cubic feet of fine illuminating gas from each cord of wood used. J. C. W. Stanley, Port Mellon, B.C. the company's engineer, designed an apparatus for obtaining the gas without any harmful result to the pulp itself. It will be used for fuel at the company's mills, as well as for other purposes.

—An important step in the development of engineering chemistry was taken at the recent New Haven meeting of the American Chemical Society by the organization of a Division of Industrial Chemists and Chemical Engineers. Arthur D. Little, of Boston, was elected chairman of the Division and vice-president of the Society, and indicated in his address the broad field awaiting development by the new organization. The Division will include a large proportion of the membership of the Society, and especially those engineering chemists whose work is directly concerned with industrial development and progress. It will begin the publication at an early day of The Journal of Industrial and Engineering Chemistry, for which a strong board of editors was elected.

THE PHYSICAL QUALITIES OF PAPER *

By R. W. Sindall, F. C. S.

(Concluded from Last Issue.)

The tensile strain of a high-grade rag paper after being folded backwards and forwards 120 times is only reduced 50-60 per cent.

In one case the writer tested a strip and found a paper breaking at 68 lbs. under normal conditions still required 30 lbs. for fracture after folding 120 times.

Air Space.

Of modern papers the light bulky material, or "Featherweight," as it is frequently termed, so much in vogue for books, is a most interesting example of the influence of conditions of manufacture.

This paper is made from esparto with occasionally a small proportion of chemical wood pulp. Very little size is used, and only small quantities of mineral matter such as china clay. The fibre is beaten quickly and only for a short period. The wet sheet of pulp formed on the machine wire is only lightly compressed between the press rolls instead of being submitted to great pressure, as is usually the case, and then carefully dried. The process of calendering applied to ordinary papers in order to impart a surface or "finish" is omitted, first because no such finish is required, and secondly because the process tends to compress or close up the sheet and reduce its bulkiness.

The effect of this special treatment is best seen by contrasting the bulky esparto featherweight paper with the normal magazine paper made from esparto. In the latter case a smoother, heavier, stronger sheet of paper is made from identically the same raw material. But the pulp is beaten longer, mineral matter and size are added in suitable proportions, while the press rolls and Calendars are used to the fullest extent.

On analysis two such papers might prove to consist of:—

	Parts by Weight.	
	Feather-weight.	Ordinary.
Esparto fibre ..	96.0	95.4
Ash, etc.	4.0	4.6
	100.0	100.0

But if the papers are compared in the terms of the composition by volume, it will be found that the featherweight contains a large amount of air space.

	Composition by Volume.	
	Feather-weight.	Ordinary.
Esparto fibre ..	28.0	65.5
Ash, etc.	0.7	1.8
Air space	71.3	32.7
	100.0	100.0

In other words, the conditions of manufacture for the bulky paper are such that the fibres are as far apart from one another as possible, and that the cohesion of fibre to fibre is reduced to a minimum.

While paper of this description is agreeable to the printer and probably to the general reading public, yet its strength and physical qualities from the point of view of resistance to wear and tear are of the lowest order. It is very difficult to rebind books made from it, which is not altogether to be wondered at seeing that the bookbinder's stitches can hardly be expected to hold together sheets containing 60-70 per cent. of air space.

The volume composition of a sheet of paper therefore becomes an important matter. The usual analysis of any substance is expressed in terms of composition by weight, but for any material which consists of a number of constitu-

*Read at the meeting of the Library Association, London, November, 1907.

ents it is also possible to express the proportion of actual volume in the bulk of the substance occupied by each constituent.

In the case of a sheet of paper the volume is determined by its length, breadth and thickness, and it is possible to calculate in a cubic inch of paper how much of the space is occupied by the several constituents. The large proportion of air space in a bulky paper is to be accounted for by the rough unglazed surface of the sheet, so that a book is rendered light and bulky on this account. As experimental evidence of this the reduction in thickness of such a book if put into a copying press may be noted. The calculations by which the volume composition is arrived at are rather complex but exceedingly interesting, and the reader is referred to the author's work dealing with the subject.*

"Art Papers."

The physical qualities of an art paper present features which are diametrically opposite to those of the featherweight papers. Owing to the presence of a mixture of clay and glue brushed into the interstices of the "body" paper and then plastered upon the surface of the paper as a thick coating, the ultimate material is heavy and dense.

Analysis of an Art Paper (a Typical Example).

	Percentage by Weight.
Fibre	77.5
Ash, etc.	22.5
	100.0

	Volume Composition Per Cent.
Fibre	68.3
Ash	12.0
Air space	19.7
	100.0

*See Paper Technology, R. W. Sindall, F.C.S.

The sole merit of this substance is the facility with which half-tone process blocks can be utilized for the purpose of picture production. Beyond this nothing can be said. The paper is brittle, susceptible to the least suspicion of dampness, with a high polish which in artificial light produces fatigue of the reader's eyes very quickly, heavy to handle, and liable to fall to pieces when bound up in book-form.

The main object of coating the paper with mineral matter is to produce an absolutely even level surface upon which the printing can be effected. However highly glazed a sheet of paper may be the surface is never absolutely even owing to the crossing and recrossing of the fibres in the sheet.

The irregularity of surface can easily be seen when a section of a paper is examined under the microscope, whilst a coated surface when examined under similar conditions presents a uniform appearance.

Standards of Quality.

Even when the properties and characteristics of paper are judged simply from the point of view of the physical qualities, it is easy to see that the selection of a standard quality is almost impossible without taking into consideration the purpose for which the paper is required. If the problem is still further complicated by the introduction of commercial elements in regard to price, then the task is almost hopeless.

The most that can be done is the broad division of papers into certain classes with distinct provisos as to the omission of undesirable ingredients. Such classifications would be determined by questions chiefly affecting durability and freedom from constituents likely to cause decay. The first attempts at securing papers of desirable composition were instituted by the Government of Germany some years ago. In our own country His Majesty's Stationery Office has laid down certain rules and regulations as to paper supplied by contract, and in America a good deal of work has been done

recently in this connection. But all such official enterprise has left untouched the more important problem of educating the printer and publisher to an appreciation of conditions other than the mere "look" and appearance of his work. As a matter of fact no one in particular can be blamed. A paper-maker hits on a "novelty" in paper with possibly the strong recommendation of its being a little cheaper than something at present in use. The printer tries it and finds the effect somewhat attractive. The publisher is persuaded by the price, the printing and the novelty, and so the paper finds a market.

SOFTENING OF WATER.

Lime and magnesia are practically insoluble in pure water, but are soluble in water containing carbon dioxide gas, as this gas unites with them and forms their respective bicarbonates, which are soluble.

Calcium bicarbonate is readily decomposed into calcium carbonate when water in which it is dissolved is heated long enough to eliminate the carbon dioxide gas. In this manner calcium carbonate is deposited in the boiler. At ordinary temperatures calcium carbonate is soluble in water; but when water is raised to a temperature of approximately 300 deg. F. it is entirely forced from solution. Calcium carbonate is deposited in the form of a loose powder or mud which does not readily form scale by itself, but when deposited in combination with other substances is mechanically held by them in the form of hard scale.

Magnesium bicarbonate reacts in the boiler in the same manner as calcium bicarbonate, but the carbonate, being unstable under high temperatures and pressures, is decomposed into magnesium hydrate or oxide, in which forms it is usually found in boiler scale.

Calcium sulphate (gypsum or plaster of Paris) is generally spoken of as sulphate of lime. One part of it is soluble in about 386 parts of water at 70 deg. F. Its solubility decreases as the temperature of the water increases, and at about 300 deg. F. (corresponding to 55 lb. boiler pressure) it becomes practically insoluble and is precipitated in a crystalline form, and readily fastens upon the shell and tubes of a boiler, forming a scale of great hardness.

Calcium chloride is very soluble in water, but is seldom found in any great quantities. It is corrosive in its action under the influence of high boiler temperatures and pressures, but does not form boiler scale itself. However, when the sulphates of other metals are present, reactions take place between it and these sulphates which result in the formation of a hard calcium sulphate scale.

Magnesium sulphate (Epsom salts) is a very common constituent of mineral waters, but being extremely soluble, does not form boiler scale. However, when in combination with carbonate of lime, a chemical reaction takes place between them which forms hydrate of magnesia and sulphate of lime, which together form a very hard scale.

Magnesium chloride, although it does not form a scale, is a very objectionable mineral, being corrosive in its action, readily pitting and grooving the boiler. Bicarbonates of iron and aluminium react identically to calcium bicarbonate, and after being freed from the carbon dioxide gas, readily decompose into their respective oxides. This reaction is often noticed in many waters which deposit a reddish powder after standing exposed to the air for a short time. These oxides, generally spoken of as iron and alumina, are usually found in water in such small quantities as to have no great bearing upon the formation of scale.

Silica (common sand) is contained in almost all waters in very small quantities. It is most frequently found in combination with alumina.

Free sulphuric acid occurs most frequently in mine water and in rivers of

coal mining districts. It is a very destructive acid when introduced into boilers, as it immediately attacks the iron, forming sulphate of iron, which is readily decomposed to hydrate of iron and free sulphuric acid, which again attacks the iron. Such a reaction is spoken of as regenerative.

Free carbon dioxide, found in the majority of natural water, has a corrosive action upon iron.

Suspended matter (mud) may be either organic or inorganic matter held in suspension, and is generally present in variable quantities, depending upon the source of supply and the season of the year. Suspended matter enters into the formation of boiler scale only in a mechanical manner, being cemented in the scale by other minerals.

Sodium sulphate (Glauber salt), sodium chloride (common salt), and sodium carbonate (soda ash) do not form boiler scale and are not objectionable unless present in large amounts, when they cause foaming and priming.

The boiler room, being the heart of all industries is naturally the first place where the effects of hard water will be seen. When a water containing mineral matter in solution is introduced into a steam boiler some or all of these impurities are forced out of solution either through the evaporation and consequent super-saturation of the water or because the water loses its power of solution at high boiler temperatures. These minerals, forced out of solution, deposit themselves in a more or less hard adherent crust upon the interior of the boiler in the form of boiler scale.

This crust, being a non-conductor of heat, tends to insulate the boiler tubes and shell from the surrounding water. This materially reduces the efficiency of the transmission of heat through the metal, which necessitates an increased fuel consumption. Various tables are published upon good authorities, giving the fuel loss due to varying thicknesses of scale; but it is practically impossible to furnish any definite figures for this loss, as the mechanical composition of the scale, the amount of heating surface covered, the type of boiler, and the working conditions, vary the loss to a considerable extent.

The following table is often given as a conservative estimate where the heating surface is evenly covered:—

Scale				
1-32	in. thick	requires	4 %	more fuel.
1-16	"	"	4 "	"
⅛	"	"	4 "	"
¼	"	"	4 "	"
⅜	"	"	4 "	"
½	"	"	4 "	"
¾	"	"	4 "	"

Rankine, in his book on mechanics, states that if the resistance to the passage of heat offered by wrought iron is taken as 1, that of carbonate of lime is 17, and that of sulphate of lime is 48.

Besides causing a fuel loss, scale is the cause of the majority of boiler shutdowns and repairs. The tubes or plate, insulated from the cooling effect of the water, become overheated and burn. With a hard coating of scale upon a boiler, the temperature of the metal must be raised to about a low red heat to transmit the necessary heat through the scale to keep the boiler under pressure. The iron soon becomes granular and brittle under this temperature, and is liable to give way under pressure. The scale, being thicker in some parts than in others, causes an uneven heating of the metal, forming swells, bags or cracks, which necessitate new tubes or a patch on the shell.

The hardening ingredients in water destroy the effect of large quantities of soap by uniting with it and forming an insoluble compound known as "soap curd." Each degree of hardness per gallon of water destroys approximately 1½ pounds of soap per 1,000 gallons of water before any detergent action is produced. In other words, the hard water is softened by the use of soap before any beneficial action is obtained from the soap. To overcome this wasteful result

laundry men are forced to add sodas to the water, which precipitate the hardening ingredients upon the goods, making them very harsh. These sodas also rapidly destroy the fibre. The soap curds deposited in the fibre of the goods, being insoluble, cannot be removed by subsequent risings. These curds cause white goods to become a dirty grey and are decomposed by the hot iron, causing greasy appearance, yellow stains or streaks, most frequently noticed at the seams. The harshness, due to these curds and the hardening ingredients precipitated by the washing sodas, is especially noticed in woolen and flannel goods. Furthermore, where soap curds are deposited upon goods to be bleached, it is impossible to get a thorough bleaching, as the solution cannot penetrate the portion of the fibre encased by curds. In dyeing, the curds, by filling up the pores, prevent a complete fixture of the dyes, causing spots, streaks, and uneven shading. They also act in some cases as a resist, preventing the fixation of the dyes, and with other coloring matter they act as a mordant. Some dyes are also destroyed or their colors changed by a combination with the lime and magnesia of the hard water.

"Softening" water is the removal of the minerals from the water which cause "hardness." These ingredients are removed by adding chemicals to water which react with the hardening substances and change them into insoluble compounds, in which form they may be separated from the water. The chemicals generally used to precipitate the scale forming ingredients are quicklime, soda ash, caustic soda, and tri-sodium phosphate.

The following table shows the comparative cost of the above chemicals to precipitate the same amount of hardening ingredients:—

1 lb. carbonate of lime requires for its precipitation—

0.56 lb. quicklime.
0.80 lb. caustic soda.
2.53 lb. tri-sodium phosphate.

1 lb. sulphate of lime requires for its precipitation—

0.78 lb. soda ash.
1.86 lb. tri-sodium phosphate.

The above table clearly shows that lime and soda ash are the cheapest reagents which can be used.

EFFECT OF THE MACHINE ON HARD SIZING.

Sizing is primarily a chemical reaction depending on the precipitation of the rosin in a state of fine division. The size of the particles is adversely affected by the presence in the pulp of precipitating agents such as salts of lime, and Dr. Klemm also expresses the opinion that to obtain the best results the alum ought not to be added before the size but after it, because in the former case the rosin is precipitated in the form of coarse particles.

But given that the precipitation of the rosin in the pulp has been effected under the most favorable conditions, there still remain a large number of circumstances connected with the working of the paper machine which will influence the ink resistance of the finished paper favorably or unfavorably.

First, the manipulation of the machine wire and the amount of shake which it receives determine the uniformity of the structure of the paper. On this depends the nature of the pores on the surafce of the sheet and the tendency of the ink to penetrate by capillary action.

Next comes the action of the vacuum boxes, especially in the case of papers containing much mechanical wood, and especially when the structure of the paper is already somewhat "wild," the action of the suction boxes is liable to produce small soft sized spots in the paper where the pores through which the ink can penetrate the surface are larger than usual. Such spots also give trouble when the paper is required for coating or staining purposes. At any rate, if hard sized paper is required it is essential that the stuff should be so prepared and

worked that the paper is thoroughly well "closed."

But the factor which exerts the greatest influence on the hardness of the sizing is the manipulation of drying cylinders. Errors may arise through too cautious application of the heat, as well as by overheating. Engine sized paper, if merely air dried at a low temperature, will not show its maximum resistance, because the particles of rosin are not fused together. But this fusion is not merely a matter of the temperature reached, say, on the last drying cylinders; in order to obtain it the rosin must be subjected to a certain degree of temperature while it is still in the presence of a certain amount of water.

Hard sizing is then the result of the most favorable temperature simultaneously with the most favorable degree of moisture. In carrying the paper over from the wet end to the drying apparatus, sudden and violent changes of temperature are to be avoided, otherwise the paper becomes irregular and cockly. The first drying cylinders, therefore, must serve as intermediaries, and must not be heated too strongly. But as soon as this purpose is accomplished the temperature of the paper must be constantly and rapidly raised, so that it reaches 175-195 degrees C. before any considerable quantity of water has been evaporated. This is the most favorable temperature for hard sizing, but it must be understood that an opportunity must be afforded for the interior of the sheet to reach this point, as well as the top and bottom surfaces. In badly constructed cylinders the temperature of the walls may not be evenly distributed, and may be higher at the end at which the steam enters than at the other end. In such cases streaks of harder and softer sizing will be noticed in the machine direction of the web.

When once the right degree of moist heat necessarily for the completion of the sizing has been reached, any further increase of temperature is harmful to the paper, since if the last cylinders be too hot, a well sized paper may become soft sized again under the pressure of the calenders. The temperature of the cylinders should therefore gradually decrease toward the end of the drying apparatus, particularly since the paper when dry gets hot more readily than when it is moist.

THE CHEMIST AND THE COMMUNITY.*

By Arthur D. Little, Chemical Engineer, Boston, Mass.

In the accounts of the war between Japan and Russia frequent reference was made to the parties of chemists who, far ahead of the main army, were testing water supplies and posting notices which warned the oncoming troops where danger from polluted water must be avoided. It seems to me that this little vanguard well typifies what the chemist should stand for and where he should be found in his relations to the community. He is, or should be, essentially a pioneer, pushing forward and serving the community in the best sense in serving science.

Chemistry enters so intimately, even though unobtrusively, into every phase of modern life and thought that it is, perhaps, impossible to present in any adequate degree the real dependence of the community upon the work of chemists, past and present. Industrial revolutions are seldom chronicled, and more rarely celebrated, though their influence upon the welfare of mankind may be as profound as that of other revolutions, the records of which are traced in blood. It can no longer be said, as was said to the father of chemistry as he passed out to execution, "The Republic has no need of chemists."

* Abstract of address delivered at Columbia University before the American Chemical Society and Section C of American Association for the Advancement of Science.

Prices rise and fall with the variations in the gold supply as the barometer responds to the changing pressure of the atmosphere, so that to the cyanide and chlorination processes which have so greatly increased the world's supply of gold must be ascribed a potent influence on market prices everywhere. With the development of the steel industry have come great fortunes and greater corporations, bringing with them social benefits and social problems hitherto unknown. This industry rests pre-eminently upon the work of chemists, as its greatest master has been quick to testify, and is to-day at every point under the strictest chemical control. The Bessemer process alone was estimated by Abraham S. Hewitt to add, directly and indirectly, $2,000,000,000 yearly to the world's wealth. Of this vast sum Bessemer himself retained in all about ten million dollars, or one-half of one per cent. of his contribution to the community in a single year. And this is characteristic generally of the rewards which come to chemists. They are not taken from the common fund, no man is poorer for them, their recipient has made others richer in those rare cases in which he has become rich himself.

Chemists here and abroad have hardly finished celebrating the fiftieth anniversary of the discovery of mauve, the first of the coal tar colors, and have been happy in the knowledge that its discoverer was still among them to receive their congratulations and rejoice with them at the splendid outgrowths of his work. In the addresses to Perkin at the time it was estimated that in the industries based on his discoveries no less than $750,000,000 is invested. As a result profound economic changes have been brought about not only in England and Germany, but in India, South America, Mexico, China and Japan. Our fastest dyes are now produced synthetically, the range of the dyer's art has been widely extended, and through collateral channels new and powerful agencies for combating disease and suffering have been placed in the hands of physicians everywhere.

Few of the industries upon which the prosperity of the country and the comfort and material well-being of its inhabitants depend have not experienced within the memory of those before me changes so profound and so far-reaching in their effect as to be fairly described as revolutionary. I believe it to be within the truth to say that in the great majority of cases these changes have been initiated or accelerated by chemists. For our present purpose it is unnecessary, even if it were possible, to catalogue the materials for which, at prices permitting their general use, the community is indebted to the chemist. They comprise a large proportion of the things which are regarded as among the necessities of life, without which comfortable, or even decent, living would be impossible. With reference to productive industry generally, it may be said that in many instances the chemist is the most effective agent for standardizing materials, controlling the course of processes, and minimizing wastes.

The chemist has been similarly active in respect of matters pertaining to public health. One has but to recall the splendid pioneer work of Drown in connection with the study of public water supplies in Massachusetts, work which is still regarded everywhere as the standard for other communities. The sanitary engineer cannot work without the chemist, the physician relies upon him for the most potent means for avoiding or arresting disease, or alleviating suffering, and domestic economy and science make increasing demands upon the laboratory.

The number of chemical problems with which manufacturers, large and small, throughout the country are grappling, consciously or unconsciously, must be very great, indeed, and their inability to solve them readily constitutes a heavy drag upon production. There is little doubt that a large pro-

portion of these problems have either been solved already without their knowledge, or are of such a nature that they require little more than their statement to a chemist of experience to permit of their immediate solution. They still remain problems, either because the manufacturer has no proper conception of what chemistry can do for him, or because the chemist to whom they may have been submitted is ignorant of the conditions injected into the problem by the requirements of practice. Were both parties to the matter properly informed, I have no doubt whatsoever that ten times the number of chemists now at work in the United States could be employed to the great benefit of our industries and the advancement of the position of our country in the world. One obvious step toward a remedy for the situation is a closer touch and cooperation between societies of chemists and associations of manufacturers. Manufacturers might well appear from time to time before the one and chemists before the other, to the good of both.

As a technical chemist, I speak with some diffidence to those engaged in pure science, but I believe the question may be fairly put, whether both science and the community might not be benefited by some readjustment of our ideas as to what constitutes pure science and the extent to which the exponent of pure chemistry may properly allow himself to be led into industrial work. Scientific research in Germany is "the greatest financial asset of the Fatherland," because there the greatest minds in chemistry come into close touch and contact with the problems of commercial enterprise. The synthesis of indigo is no less a triumph of pure chemistry because of its industrial importance, and a synthesis of the resins in the juice of the milkweed can hardly be regarded as more commendable from any point of view than a synthesis of india rubber would be. Where, then, there is so much to do, is it not possible to pick the problems with more direct reference to the immediate needs of the community? By far the larger part of our best research is carried on now in the laboratories of our great industrial plants, and if the teacher and the individual investigator are to match it they must, in case of most of them, have the broadening influence of personal contact with the conditions and needs of industry.

CANADIAN FORESTRY ASSOCIATION.

The next annual convention of the Canadian Forestry Association, which will take place on March 11th and 12th, 1909, will be in Toronto, the board of trade of that city having sent an urgent invitation to that effect. Professor J. H. Macoun, of Ottawa, having resigned as editor of the Canadian Forestry Journal, F. W. H. Jacombe, of the Dominion Forestry Department, has been appointed in his place. An active membership campaign is being undertaken.

SUPERCALENDERED PAPER.

For making good supercalendered papers the stuff must be properly prepared in the hollander so as to give a strong, uniform, well-felted pulp. Special attention must be given to the purification of the stuff on the sand tables in order to eliminate particles of dirt which would spoil both paper and calender bowls. For this purpose considerable dilution of the stuff and a maximum area of sand tables are essential.

But the chief responsibility of preparing the paper for the glazing calenders falls on the paper machine tender. First of all absolute uniformity in the thickness of the sheet must be ensured, and the wire and the slices must lie perfectly horizontal and parallel. This is not always easy on very wide machines owing to the sagging of the register rolls.

The next care must be to ensure a strong but uniform suction in the vacuum boxes. If the mouth of the suction pipe draws from the open part of the boxes it drains more water out of those portions of the paper nearest to it. Also in the case of suction boxes covered with perforated plates the holes must be so arranged that no stripey effect is produced.

Tearing of the paper on the calenders may sometimes be traced to the fact that the doctor on the top couch roll does not bear evenly on all parts and lets water through at one spot. The supervision of the wet presses is perhaps the most important part of the operation. All presses wear hollow in the middle in the course of time, thus making the centre of the sheet thicker and damper than the edges, an effect which is exaggerated rather than corrected by the drying cylinders; either the edges must be overdried or the middle must be left damp, both being fertile causes of breaking on the calenders. This difficulty of the wet presses is best met by providing "anti-deflection" bottom rolls, or else a more uniform pressure may be obtained by grinding the rolls to a slightly convex form, so that their diameter at the middle is about ⅓ to ½ mm. larger than at the ends. The "Schnitzer" grinding tool is admirably suited for this purpose, since it can be mounted on the roll in a few minutes without removing the latter from its bearings. The doctors on the upper press rolls should be given a slight reciprocating motion to avoid local scoring.

The object of all the above precautions is to avoid wavy paper, which would gather up into creases and cause breaks during glazing. On the drying cylinders the felts must be stretched fairly tight; for supercalendered papers cotton felts are best for the first group of cylinders because, being always wet, woolen felts wear away thinner at the middle than at the edges. For the later cylinders, however, woolen felts answer best. A uniform and careful graduation of the heat of the cylinders is very necessary. No fixed rule can be laid down for the amount of water to be added in the damping; it must be adjusted according to the composition and thickness of the paper and the length of time allowed before glazing, but in any case it must be absolutely uniform.

With regard to the calenders themselves it may be remarked that the bowls should be ground so as to fit accurately when they are under working pressure, and the bottom one may be slightly convex. Large calenders require a considerable amount of power, and the non-recognition of this results in the slipping of the belts with a consequent enormous wastage of paper and belts. A large number of small diameter gives a better result than a smaller number of bowls of large diameter, the smaller bowls having a stronger grip on the paper.

MILL WASTE.

A writer in the "Papier Zeitung" makes the following observations on waste from the paper machine. Careful estimations have shown that in the course of the ordinary working of the paper machine, without a stuff economizer, the wastage of stuff in the effluent waters amounts to 8 per cent. of the total production of paper. This, of course, only applies to mills which are not subjected to special restrictions as regards their effluents. The best of all stuff economizers is the Füllner filter, which is capable of recovering nearly the whole of the suspended matters of the water. With proper supervision of the filter no contamination of the stuff will occur, and, since the quantity of water in the filter chest at any one time is very small, the stuff is recovered as fast as it runs from the machine. It can thus generally be returned to the beaters at once for mixing with the same batch of paper.

This is a great convenience when the changes of color and composition of the production are comparatively frequent.

The use of the Füllner filter is by no means confined to the paper machine. In mills making fine rag papers it can be applied advantageously for recovering the fibres passing through the washing drums of the breakers and the beaters. If the stuff recovery from these be properly organized and confined to the later stages of washing, the recovered stuff is quite clean enough to be added to the beaters shortly before discharging. By an arrangement of three-way valves the dirtier washings from the rag breakers may also be passed through a filter, and the recovered fibres used as a filling for making wrappers. The writer considers that most paper mills should possess rough board-making machines for preparing boards and wrappers for their own use. The dirty recovered stuff from the Füllner filters would then be mixed with other fibrous wastes, such as the refuse from the rag salles, rag dusters, engine-cleaning wastes, gunnies, and dirty broken papers. In this way everything can be utilized and considerable economies effected.

WORKING UP OLD NEWSPAPERS.

The Wisconsin scheme for making newspapers of black paper and white ink is probably impracticable, but as there is still considerable interest taken in the idea we give some particulars of a plan suggested by Mr. Koops over one hundred years ago in England. The process is interesting for two reasons. It is a very early instance of the many attempts which have been made to rehabilitate printed paper and MSS., and also of the use of chlorine for bleaching paper.

The first thing to be done, according to the directions given by Koops, is to separate English printed paper from German paper, and to sort all written and printed papers according to quality. The paper is then torn in pieces, and "conveyed into an engine to open it gently, and at the same time to wash it quite clean." The pulp leaving the engine is freed from size by means of hot water. The pulp, corresponding to 336 pounds of paper, is then boiled up with 576 gallons of water, and, after half an hour's boiling, a solution of 24 pounds of American potash (pearlash) for German printed paper, 18 pounds for English printed paper, and 10 pounds for MSS. is added. The potash is previously dissolved in 20 gallons of a lime water made by dissolving 180 pounds of fresh quicklime in 1,152 gallons of water. After the addition of the potash the boiling is continued until the ink is loosened, which takes from two to three hours. The mass is then left to cool. The pulp is next discharged into a receiver provided with a perforated false bottom of copper. From this pulp equivalent to 140 pounds of paper is taken, and rinsed free from alkali. It is then "brightened" with a proper quantity of a solution made by passing the gas evolved in a retort from 3 pounds of common salt and 2 pounds of black "wad" (peroxide of manganese) together with 3 pints of "vitriolic" acid (sulphuric acid) into 150 gallons of water in a cask. The retort is heated "by a sand-bath." It takes, it appears, six hours to impregnate the water completely. The average amount of the impregnated water required for the pulp from 140 pounds of paper is from 10 to 12 gallons. The impregnated water is, of course, chlorine water. This pulp is then to be ground in order to be made into paper.

For paper which is all MSS. Koops adopts the following variation of the latter parts of the process. After the removal of the size, the pulp from 140 pounds of assorted clean MSS. is put into a box lined with copper, the sides and bottom full of holes. The box is fixed in a press, and the water is forced

out, until the pulp retains no more than its own weight of water. It is then put into a wooden case, the inside of which is covered with a thick mixture of white lead and water. The lid of the case is well luted with pipe clay, and the neck of a retort enters the box from a hole at the back. In this chlorine is generated as above described. The amount of the gas required varies according to the color and condition of the raw material from which the ink has to be extracted. From thence the pulp is conveyed to an engine, to be ground more finely, and into a substance suitable for the manufacture of paper.

MAKING THIN PAPERS AT HIGH SPEED.

A contributor to the "Papierfabrikant" points out that on fast-running machines the danger of the paper sticking to the upper press roll becomes greater the thinner the substance of the paper which is being made. In avoiding this trouble almost everything depends on the proper condition of the stuff, and if this be not right, no amount of adjustment of the machine will give satisfactory results. In the case of a thin paper of the "news" type, considerable knowledge and care must be devoted not only to the selection and preparation of the mechanical pulp, but also to that of the sulphite pulp. The mechanical must possess good felting properties, that prepared by the hot grinding process being most suitable. The sulphite pulp must be free from sticky, resinous matters and should possess a soft but sound fibre. If the original quality of the two kinds of pulp be not right, it cannot be made right by any treatment in the beater or on the machine. If a sulphite pulp has been cooked for too short time, or with an unsuitable liquor, or unsuitable steam pressure, or if a mechanical pulp has been ground from very old wood or with the wrong kind of stones, the pulp will never do well for thin papers. Although these things are generally known, the writer has seen many cases where sticking was caused by neglecting them. It is well known that sulphite tissue papers can only be made economically from correctly bleached wood pulp, because unbleached pulp always gives trouble through sticking for a similar reason to that cited above for thin papers of the "news" class.

COATING CLOTH WITH PAPER.

A patent granted to H. Markus, of Salford, and E. Turner Whitelow, of Droylsden, England, states that a much better result is obtained from the use of a material prepared from pulverizing paper than from animal or vegetable flock in giving a coating to cloth.

The invention consists essentially of a cloth proofed or coated with a mixture of rubber and pulverized paper, which latter retains its fibrous properties. The patentees take a finished paper (preferably of a porous quality) and in a suitable machine pulverize it to a finely divided state, but so as not to destroy its fibrous qualities. Or, instead of a completely finished paper, they take a pulp of textile or wood origin fully prepared for making paper, and after it has been dried pulverize it to a state of fine subdivision. This material is practically the same as pulverized paper.

The pulverized paper so obtained is mixed with the rubber and masticated together, and then reduced to a dough by naptha or other solvent to the desired consistency to apply to the cloth in an ordinary spreading machine in the usual manner. One, two or more coats of this proofing material may be applied to the cloth, according to the quality and thickness required.

By way of example, the following proportions are stated as giving a good, serviceable proofing: Rubber, 5 pounds;

pulverized paper, 5 pounds; naptha, 10 to 20 pounds.

Or a rubber dough may first be prepared in the usual way, and then any desired quantity of the pulverized paper mixed therewith with sufficient additional solvent to prevent the proofing becoming too stiff. If desired, a portion of the naptha may be mixed with the pulverized paper before it is introduced to the rubber.

The paper or pulp may be used in its natural or bleached color; or it may be dyed or stained in the pulp before being dried; or the finished paper may be dyed or stained in bulk in any well-known manner to give any desired color or tint to the proofing; or any suitable dyeing or staining material may be mixed with the rubber and pulverized paper when preparing the proofing.

The desired quantity of sulphur for vulcanizing is mixed with the proofing, and the material is finally vulcanized and finished in the usual way.

SCIENTIFIC WOOD PRODUCTION IN GERMANY.

Among all the nations of the world Germany receives the credit of being the most thoroughly scientific. She does with her limited natural resources what younger nations will soon be compelled to do in self-protection; she conserves them.

When our wood supplies, stored up from 100 to 500 years, are within sight of their end, and sawmills that have been moved from the white pine belt of the North to the yellow pine belt of the South have been moved to the Pacific Coast for their last stand, then Germany's scientific forestry policy will receive better recognition.

We do not think of moving a grist mill about from one wheat field to another, as the fields in turn become exhausted. After one crop is harvested another is coming on. So it must be with the sawmill and the crop of trees. If it takes fifty years to raise a tree of a given species, then one fiftieth of the forest may be cut each year, provided it reseeds or is replanted—and the sawmill stays at the same place and the workmen live in their permanent snug homes near by; the "lumber shanty" will be a thing of the past; raising trees a business like raising wheat.—From a Forest Service Circular.

ALUMINIUM PAPER.

The manufacture of paper coated with aluminium as a substitute for tinfoil has begun to assume industrial importance.

Within a year the Wickel process has been successfully applied in France to the metallizing, with aluminium, of paper of all thicknesses, from that of cigarette paper up to that of the sheets from which post-cards are made.

Aluminium paper has the advantage over tin-foil that it contains no lead. It is suitable for enveloping all kinds of confectionery, for making paper boxes, and even for wall hangings. When used as wall paper it possesses the admirable quality of being cleanable with a wet cloth or sponge.

—The Northern Engineering Works, Crane Builders, Detroit, Michigan, have issued a little booklet of "Northern" cranes (No. 24); thirty-six pages; pocket or pigeon-hole size, illustrating in condensed form, by means of about forty cuts, many of their designs of electric travelling cranes, hand power cranes, etc. Also electric hoists. The booklet may be used as a reminder to those who wish to keep before them a condensed memorandum of the types of Northern Cranes in greatest demand and as showing the varied application of these cranes, over a wide range of service, thus assisting in determining wants which can then be more fully described by their larger catalogues and bulletins.

PAPER FOR MAGAZINE PRINTING.

In one of the series of lectures recently delivered by R. W. Sindall, F.C.S., at the L.C.C. School of Photo-Engraving and Lithography, London, he took for his subject paper for magazine printing. The importance of being able to distinguish the machine direction and the cross direction of such papers was emphasized. It was pointed out that the proportion of fibres running lengthwise of the sheet was highest in a fast running news, and lowest in a magazine paper. Then it was clearly demonstrated that the expansion of paper on being wet was always in the horizontal or cross direction, and the importance of this to the printer was explained, Mr. Sindall remarking that if the printer had to deal with a paper that made bad register, and he had a large quantity in stock and wanted to do something with it, it was clear that the direction he put it on the stone or machine was very important; hence the necessity of knowing the direction of the fibres. A simple experiment for determining this was to cut a small circular piece of paper, damp one side, and the way it curled represented the direction of the fibres, or the machine direction. In ordering, say, a 20 by 40 sheet, the printer must give the papermaker information as to the way he wanted the direction of expansion to be. Another peculiarity of esparto and book papers that enabled one to distinguish the machine from the cross direction, was the iron mark, or seam, which was very plain on some papers, examples of which were shown.

The great source of annoyance to the machine-minder, wavy edges in paper, was touched upon. To overcome it was simply a question of a knowledge of the property of fibres in taking up moisture. Wet sheets of paper varied very much from day to day. If they hung them up for twelve months they would be surprised at the extraordinary difference that would take place in the weight of the paper. In the case of stacked sheets the atmospheric moisture only got to the edges of the paper, and so they became wavy. They had only to lay them out long enough for the paper to become very flat. The cracking of envelopes when being printed or folded was another illustration of the importance of understanding the affinity of paper fibres for moisture.

It was pointed out how paper was stronger in the machine direction than in the cross direction, and how important it was to remember this in book production. This fact was demonstrated by the lecturer showing how two narrow strips of paper—one cut in the machine direction and the other in the cross direction—when held up bent over, the cross-section piece bending much more than the other. It was desirable that the leaves of a book when open should lie flat, and the above knowledge would enable the printer to achieve this. It would be interesting, added Mr. Sindall, to open a large number of books and determine whether those which opened and lay flat had had the paper cut with the fibres in an outward direction, from the back to the side edges, or had been cut with the fibres running lengthwise, top and bottom.

A description of the manufacture of the class of paper used for magazine printing led to some remarks on the finished paper. A simple method was described for determining whether paper contained esparto, without the use of a microscope. This was done by warming the piece of paper in a weak solution of aniline sulphate—from a 4 per cent. solution take 20 parts and mix with 80 parts of water and warm over a flame. If it contained esparto the paper turned a rose pink color, and the depth of the pink color produced was a measure of the amount of esparto present.

On the question of the surface of the papers, the lecturer explained that esparto papers discolored more than any other, except mechanical wood pulp papers. Papers intended for the manufacture of books, if exposed under atmospheric conditions, were found to very

largely discolor. Esparto papers gave less expansion than wood pulp papers, and comparative figures were given.

LYE FOR BOILING SULPHATE CELLSTUFF.

With reference to the attention drawn by Herr Albert Ahlin in a recent issue of the Papier-Zeitung to the injurious effects of the presence of silicic acid in the lye for boiling sulphate cellstuff, Herr Th. Knosel, of Neustadt, writes that journal that, although his experience with wood pulp had not brought him to the same conclusions as Herr Ahlin, his investigation of lyes from various straw pulp factories had disclosed the presence of an abnormal percentage of SiO_2. Further researches showed instances where there was only a small proportion of silicic acid, on account of its having been automatically removed. Generally speaking, the arrangements and operation of each straw pulp mill vary, the quantity of the output being in many cases the only point regarded, without reference to its cost or intrinsic quality.

Illustrating his arguments, Herr Knosel describes a case in which a straw pulp factory at first blamed the sulphate process for the tubular boilers not acting, but finally arrived at the conclusion that the cause of the trouble was silicic acid, which Herr Knosel claims could have been removed by his process. The value to manufacturers of expert chemical advice is emphasized as being well worth the salary which some mills boast of saving by doing without a chemist.

Commenting editorially upon the above remarks, the Papier-Zeitung suggests using for the hearths, where the refuse lye residue is burnt, basic lining, such as magnesite bricks, as in Martin furnaces, silicic acid being likely to get into the product being treated if the hearth lining contains that acid.

VARIATIONS OF PAPER.

It is a very difficult task for one maker to produce a paper very similar in all respects to that of another maker's. One doubts if ever in the same mill two lots of the same kind were ever actually identical, and so for one mill to exactly imitate the make of another mill is practically impossible. An exacting market sometimes expects this to be done. When a buyer is trying to get a paper at a reduction, or a paper merchant is seeking for an order and promises to sell at the buyer's price, he takes on something difficult in attempting a commercial match. A sample is given as a given as a guide for color, feel, appearance (look through), and surface. This is about as far as a commercial match can go. The sample may contain a quantity of rag and remainder fibre esparto. The order can only be dealt with from an esparto and wood furnish—mildly analogous to making bricks without straw. If there is an appreciable quantity of rag in the sample, "self color" or natural whiteness of the esparto, and wood half-stuff is not good enough, unless indeed, it is converted into out and out oxy cellulose by excessive bleaching. "Blueing" up has to be restored to with ultramarine or an aniline dye.

If it is on the warm side a little cochineal or red aniline is used, and in this way the surface color may be more or less hit off. The look through of a colored white paper, however, differs from a self color, and the stuff has to be kept as clear as possible to match the rag and esparto article. One is not saying that even with a half-rag paper "coloring" is not resorted to, but if there is any color in our sample the difficulty of matching it is only merely accentuated. With regard to feel and surface or finish the natural softness and the fineness make a combination which lends itself to a close surface and mellow feel.—Paper Makers' Monthly Journal.

CANADIAN WOOD PULP ASSOCIATION.

The monthly meeting of the Canadian Wood Pulp Association was held during the Tercentenary week at the offices of the Chicoutimi Pulp Company in Quebec. Routine matters were discussed, and the date of the next monthly meeting was set for the 24th day of August.

WATERPROOF VARNISH FOR PAPER.

According to the German patent of a Cologne firm a glossy waterproof varnish for papers is made by mixing 450 parts by weight of alcohol with 350 parts of boiling acetone, and dissolving 100 parts of nitrocellulose in this mixture. This solution is mixed with 50 to 60 parts of dichlorhydrin and 25 to 35 parts of plastal, by stirring, and the mixture is spread thinly over the surface to be coated. After leaving a short time to dry, the treated article is subjected to a brief moderate pressure under polished plates or rollers, and will then exhibit a brilliant gloss. Plastal consists of esters and amides of aromatic sulphonic acid derivatives.

SALE OF SULPHITE MILLS

Judical Sale by Tender of Assets of Northern Sulphite Mills of Canada, Limited

IN THE HIGH COURT OF JUSTICE

Pursuant to the judgment of the High Court of Justice for the Province of Ontario, in an action of Diehl et al. v. Johnston et al., and with the approbation of J A.McAndrew,Esq., Official Referee, sealed tenders will be received up to twelve o'clock noon on the twenty-seventh day of August, 1908, by the receiver of the above company for the purchase of the following assets of the above company :—

(1) Sulphite mills situated at Sturgeon Falls, having the present capacity of twenty tons of sulphite, with a possible capacity of 70 tons per day when completed.

(2) The said sulphite mill is situated alongside of the Imperial Paper Mills of Canada, Limited, which latter mills, with the concession belonging to the said company, are also to be disposed of by judical sale.

(3) The highest or any tender not necessarily accepted.

(4) Tenders will be open by the Official Referee, J. A. McAndrew, at the office of E. R. C. Clarkson, 33 Scott Street in the City of Toronto, on the 27th day of August, 1908, at 12 o'clock noon, when all tenderers are requested to be present.

Terms of Sale—A marked check for $10,000 is to accompany each tender.

Upon acceptance of any tender, 10 per cent of the purchase price is tobe paid by marked cheque,and the balance thirty days thereafter.

In case of default by the purchaser after notice, the receiver may declare the deposit forfeited.

After acceptance, the property is to be insured and premiums paid by the purchaser, and the property to be kept in repair by him, taxes and insurance to be apportioned as of the 27th day of August, 1908.

Possession will be given upon payment of the full amount of the purchase money.

The other conditions of sale will be the standing conditions of the court.

Full particulars of the mill can be had upon application to the receiver E. R C. Clarkson, 33 Scott Street, Toronto, Canada, or to Messrs Royce & Henderson, Solicitors, Traders Bank Building, Toronto, Ontario, Canada.

SALE OF PAPER MILLS AND PULP CONCESSION

Judicial Sale by Tender of Assets of Imperial Paper Mills of Canada, Limited.

IN THE HIGH COURT OF JUSTICE.

Pursuant to the judgment of the High Court of Justice for the Province of Ontario, in an action of Diehl et al. vs. Carritt et al., and with the approbation of J. A. McAndrew, Esquire, Official Referee, sealed tenders will be received up to twelve o'clock noon on the Twenty-seventh day of August, 1908, by the Receiver of the above company for the purchase of the following assets of the above company :—

Pulp and Paper Mills now in operation, situated at Sturgeon Falls, Ontario, having a capacity of 60 tons of ground wood pulp and 50 tons of paper per day.

Pulpwood Concession, situated on the Sturgeon River and its tributaries, said to cover an area estimated at 2,750 square miles, and to contain upwards of 5,000,000 cords of pulpwood.

The Water Power and Water Rights belonging to and controlled by the said Company at Sturgeon Falls Ontario This water power is said to have a present development of 6,500 h.p , and a possible development of 12,000 h p.

The successful tenderer will be required to purchase the mill stores and repair supplies and camp supplies on hand at the time of sale, amounting to about $60,000, at 65 cents on the dollar of the inventory valuation.

Tenders will be opened by the Official Referee, J. A. McAndrew, at the office of E. R. C. Clarkson, 33 Scott street, in the city of Toronto, on the twenty-seventh day of August. 1908 at twelve o'clock noon, when all tenderers are requested to be present.

The highest or any tender not necessarily accepted

Terms of sale :—A marked cheque for $10,000 is to accompany each tender.

Upon the acceptance of any tender, 10 per cent. of the purchase price is to be paid by marked cheque, and the balance within thirty days thereafter.

In case of default by the purchaser after notice, the Receiver may declare the deposit forfeited.

After acceptance the property is to be insured and premiums paid by the purchaser and the property to be kept in repair by him, taxes and insurance to be apportioned as of the twenty-seventh day of August, 1908.

Possession will be given upon payment of the full amount of the purchase money.

The other conditions of sale will be the standing conditions of the court.

Full particulars of the timber concession water power mills and all other details can be had upon application to the Receiver, E. R. C. Clarkson, 33 Scott street, Toronto, Canada, or to Messrs. Royce & Henderson, Solicitors, Traders Bank building, Toronto, Canada.

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One good second hand Beating Engine, must be in first class condition. Capacity 800 to 1,000 pounds dry stock. Mail full particulars of what you have to offer with lowest cash price. Address 'DOMPAP,' care Pulp & Paper Magazine.

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After April 1st, (by a Swedish gentleman, at present in this country,) position as superintendent or designer of sulphite pulp or wood pulp paper mills. Large experience abroad as well as in this country. Highest testimonials for economical constructions. The advertiser is an originator in his line, especially in the chemical side of the sulphite industry. Consumption of sulphur in last sulphite mill built 8% **Brown** mech. pulp, a specialty. Address

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Copies of Paper Trade Journal for years 1897, 1898 and 1899. Will pay liberal price for single copies. Address JOHN NORRIS, Room 904, Pulitzer Building, New York City.

THE MARKETS.

Toronto, August 15, 1908.

The present is materially a somewhat dull time of the year for all kinds of business, the paper trade being no exception to the rule. As a rule, however, no great complaint can be made in respect to the status of this commodity, for, considering the season, the demand has been quite fair. This applies more particularly to news, as books and writings are a little on the slack side. The general feeling may be called strong, as everybody seems to think that with good crops and early harvesting, which now are particularly assured for a large portion of the Dominion, all business will be in stronger and larger volume after the fall. Pulp, both ground and sulphite, is still easy, with slack demand from both home and American mills.

British.—There is little life in the mechanical pulp market. Stocks are plentiful and supplies equally so. Consumers believe prices will soon be lower. Chemical pulp is also easier. The market for chemicals is steady. Bleaching powder prices are not yet settled.

—The Bagley & Sewall Company, Watertown, N.Y., who gained the contract for paper machines for the Harmsworth mill at Newfoundland, announce that through taking the contract at such a low figure in order to keep the men at work, a slight reduction in the wages will be necessitated.

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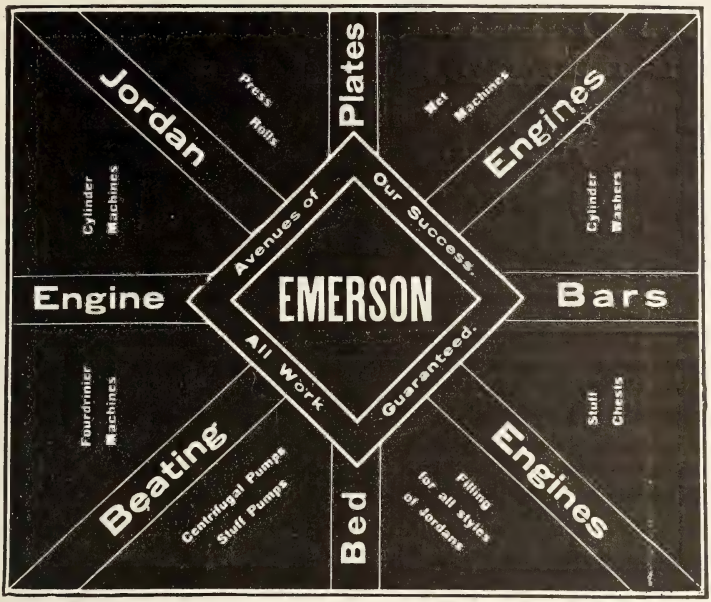

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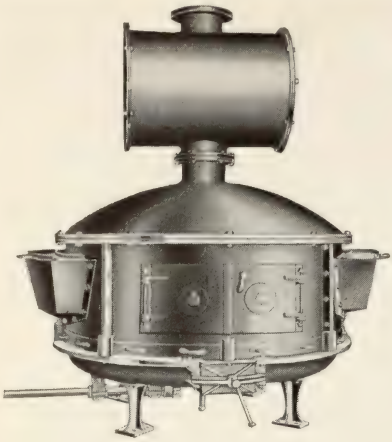

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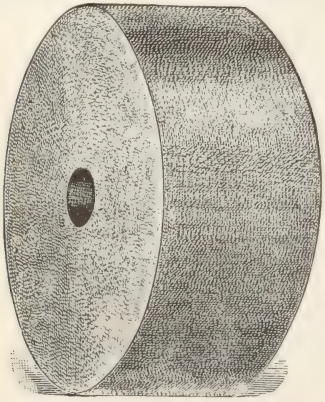

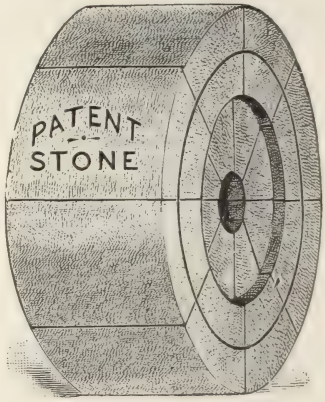

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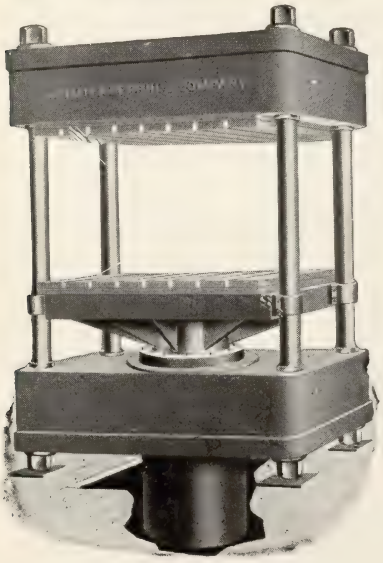

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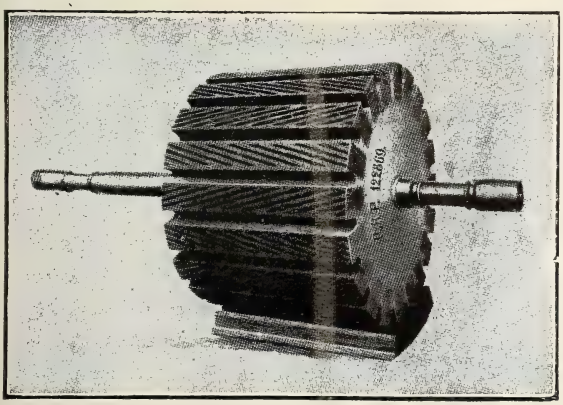

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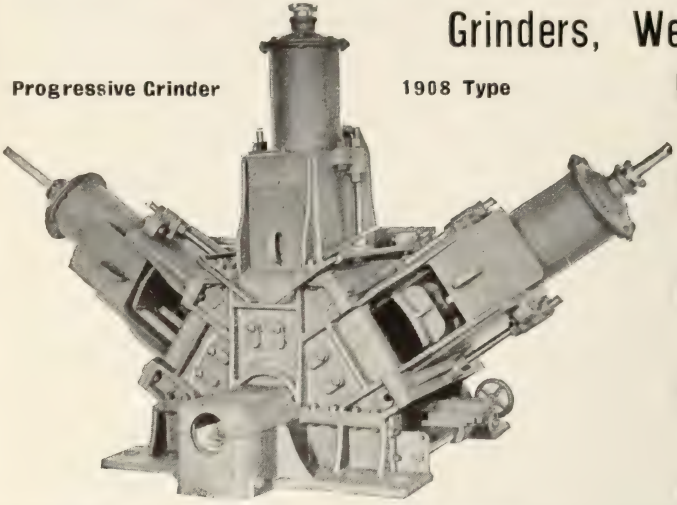

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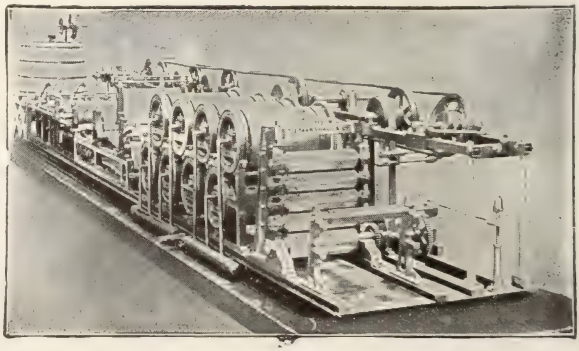

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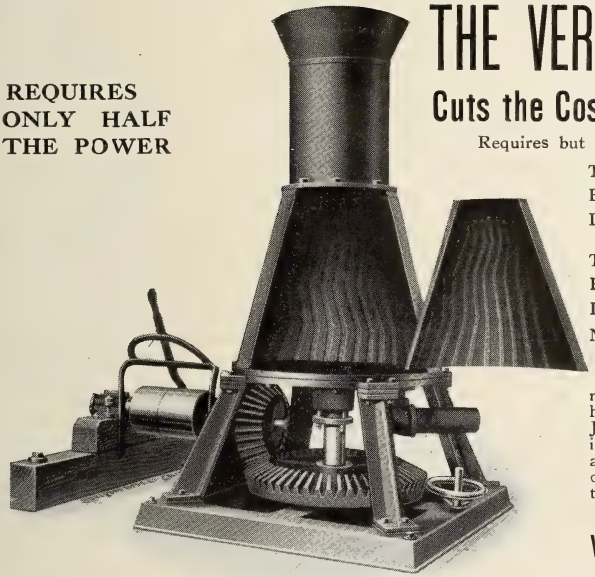

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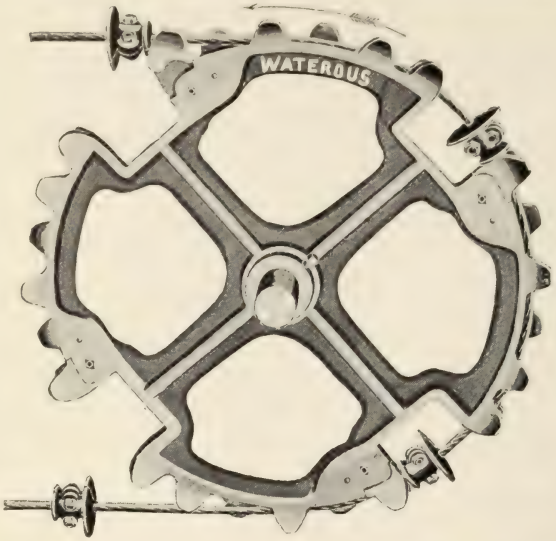

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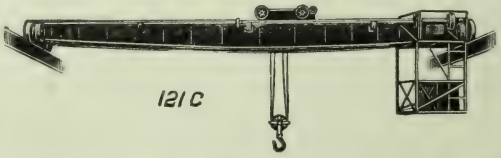

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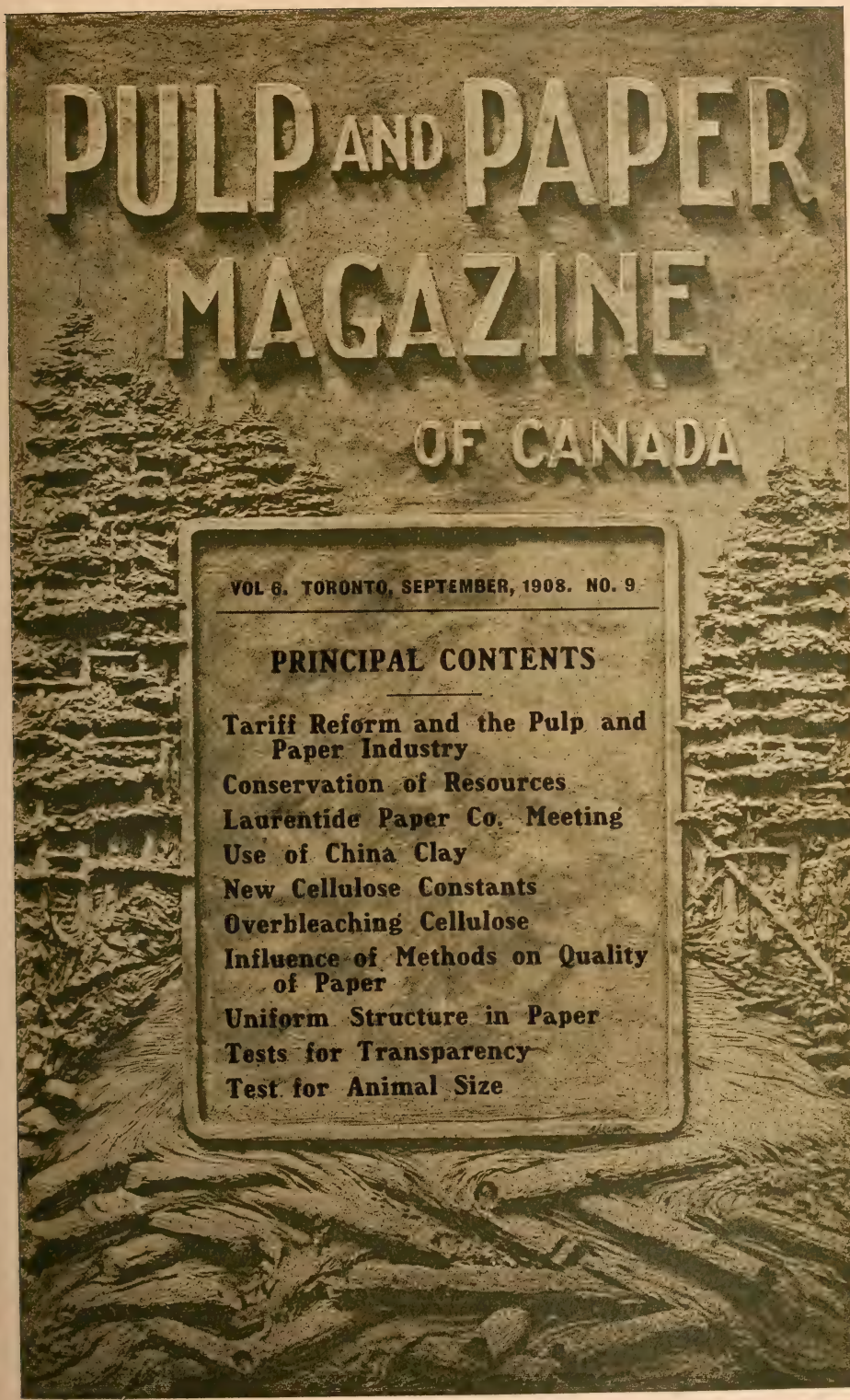

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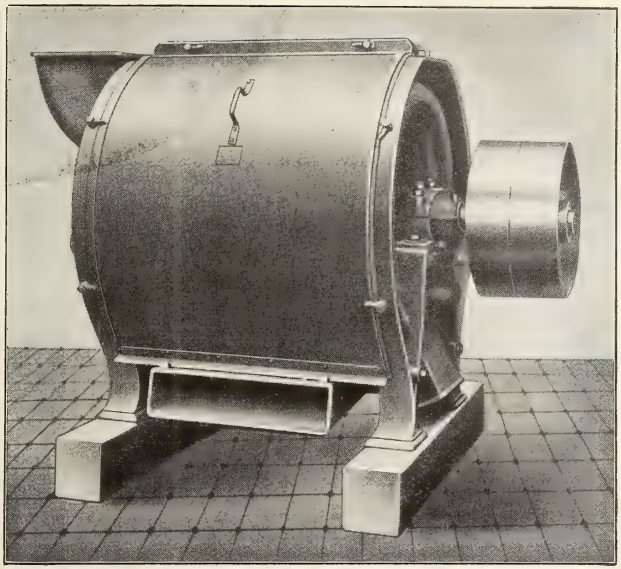

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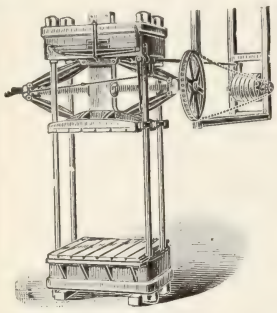

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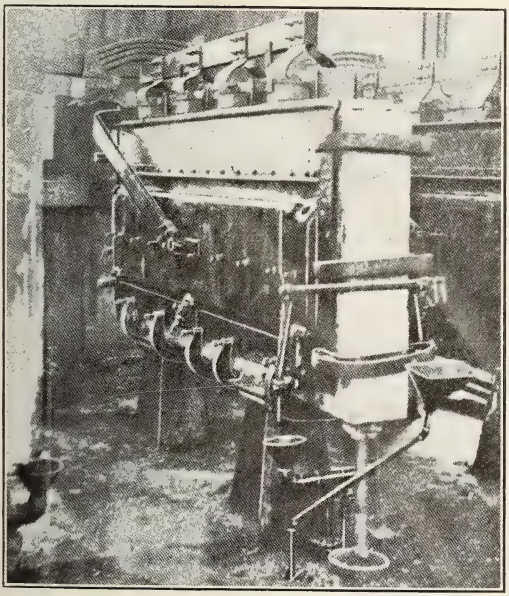

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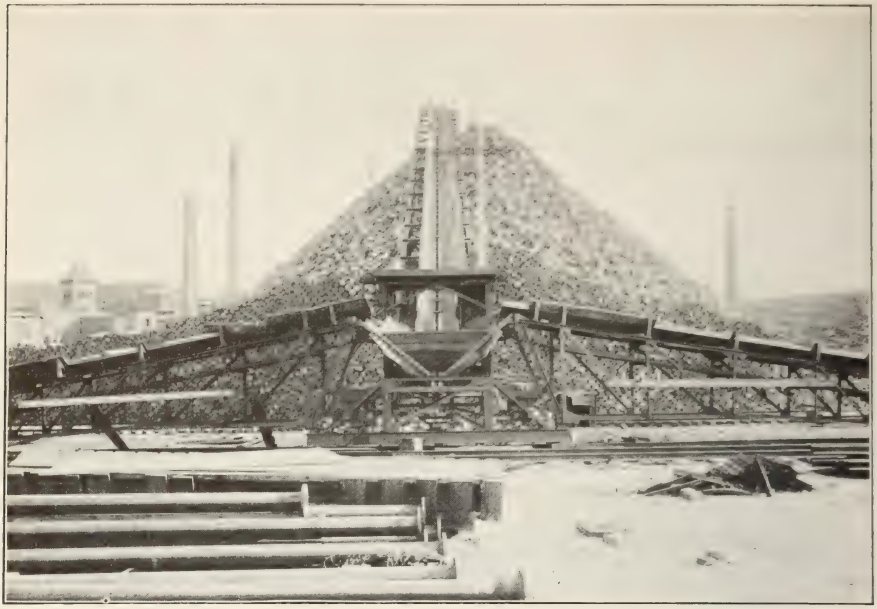

MOVABLE CRANE PULP LOG STORAGE SYSTEM AND UNLOADER

The M. Garland Company

BAY CITY, MICHIGAN

Inventors of the Cable Conveyor

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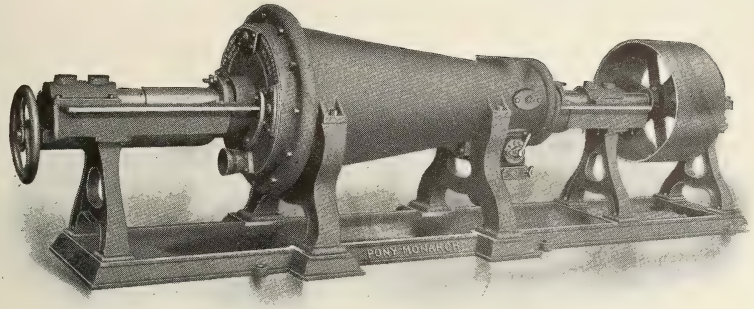

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RAG CUTTERS	STUFF CHESTS	FAN DUSTERS
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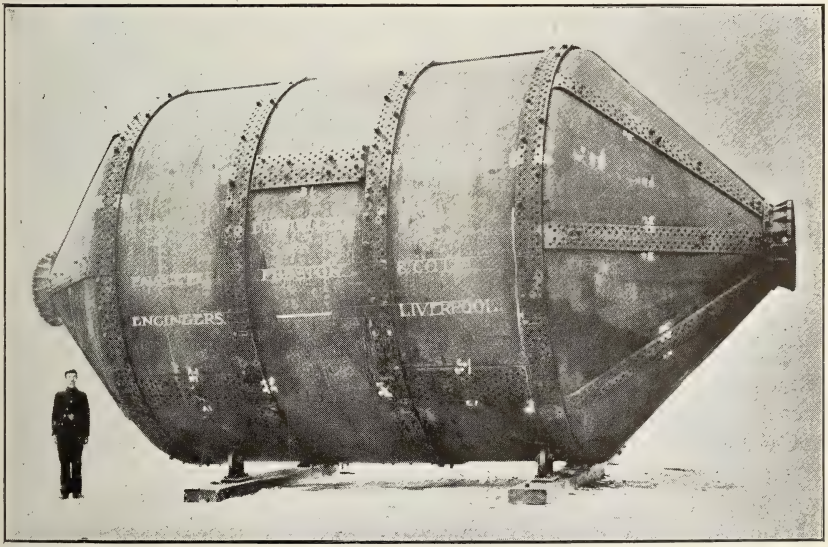

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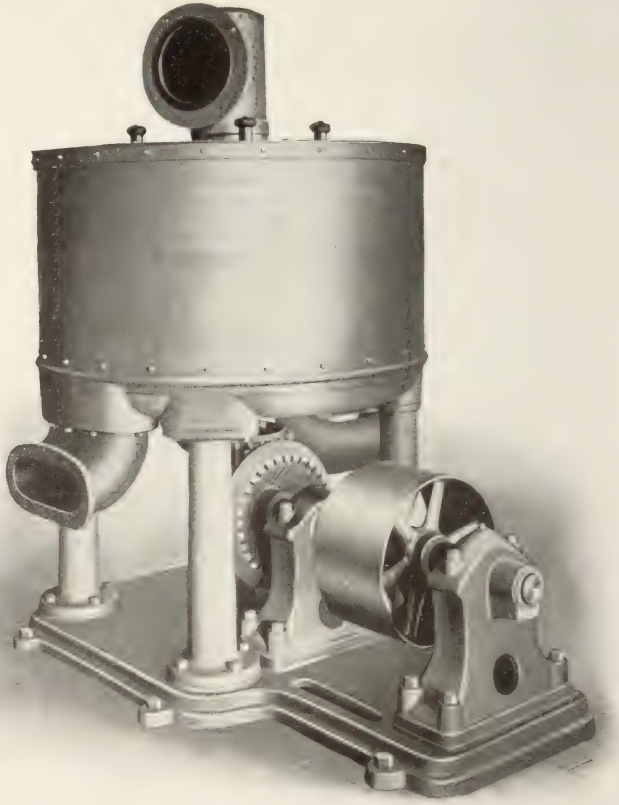

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SOLE MANUFACTURERS FOR CANADA.

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Operated by him in Mégantic District
Load 60 cords of 4' pulp wood
Weight of load 200 000 lbs
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Hauled 10 miles from loading point

WE ILLUSTRATE above the Lombard Steam Log Hauler with a train of loaded logging sleds containing 60 cords of pulpwood and weighing 255,000 lbs.

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Under more favorable conditions results are correspondingly greater.

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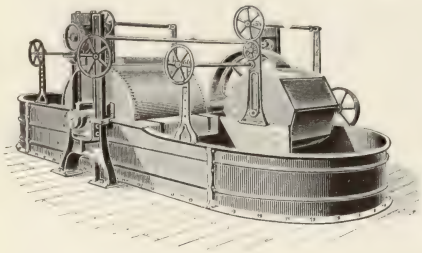

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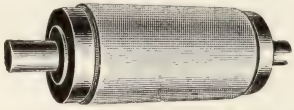

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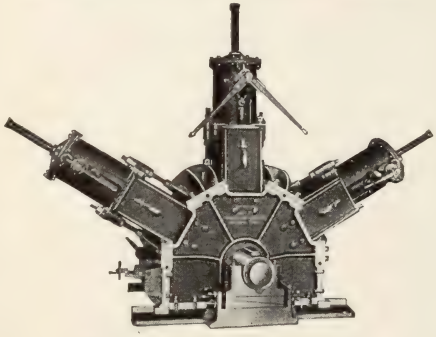

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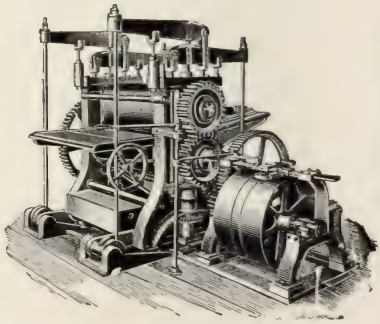

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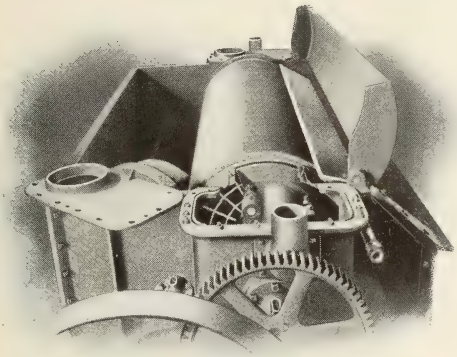

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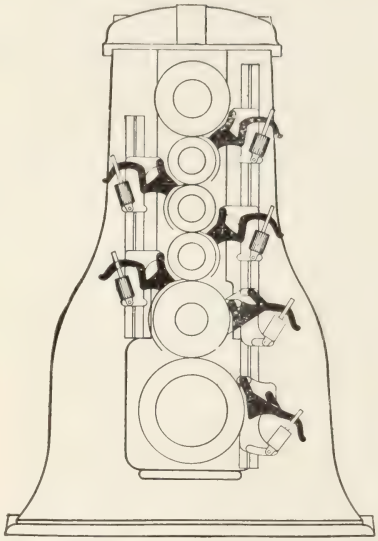

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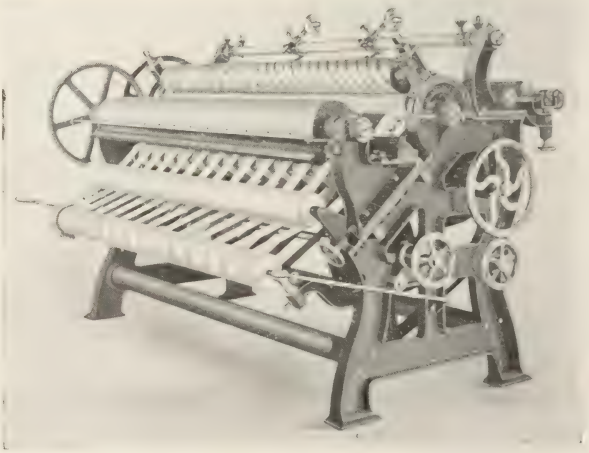

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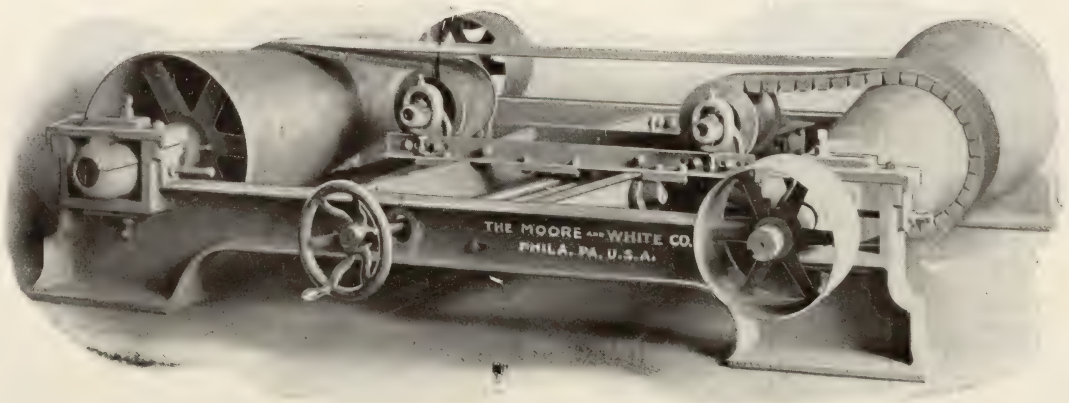

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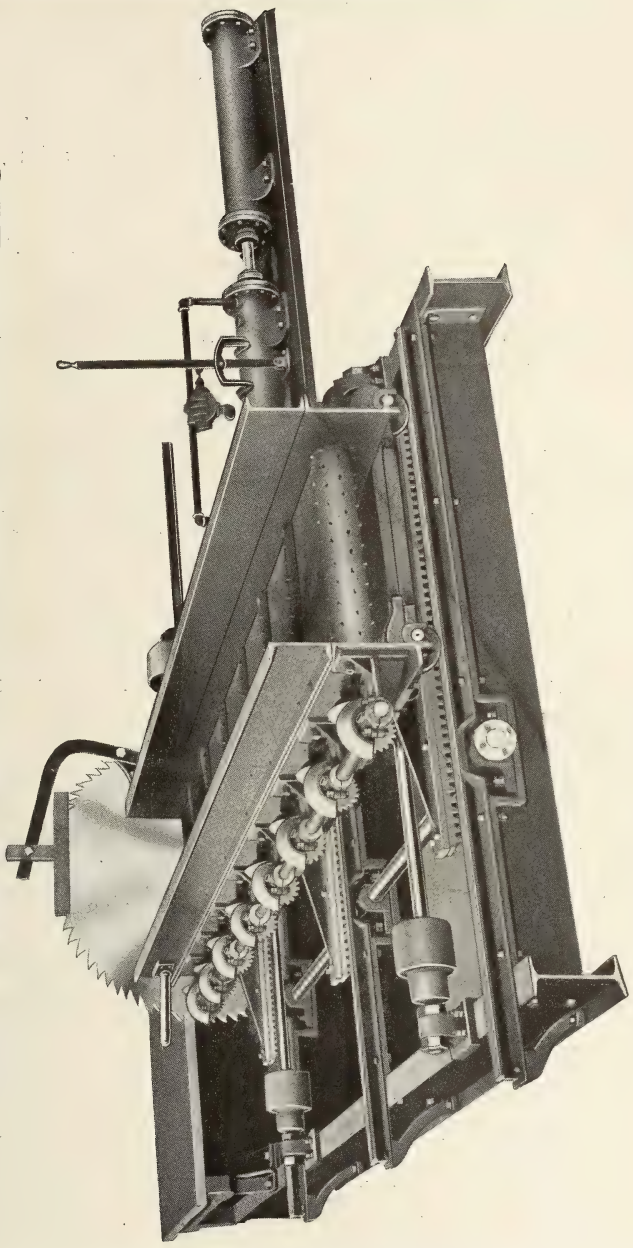

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THE
PULP AND PAPER MAGAZINE OF CANADA

Vol. 6.—No. 9. TORONTO, SEPTEMBER, 1908. $1 A YEAR / SINGLE COPY 10c

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

SUBSCRIPTIONS: Canada and British Empire, $1.00 per year; United States and Foreign, on account of postage $1.50 per year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month, and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

BIGGAR-WILSON, Ltd.,
PUBLISHERS
OFFICES, CONFEDERATION LIFE BUILDING,
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TARIFF REFORM AND THE PULP AND PAPER INDUSTRY.

The ominous extent of the destruction already wrought upon the forests of the world by the pulp and paper industry, and the increasing sense of uneasiness of those nations who see their large forest areas disappearing by this cause and by the demands of the lumber industry must force the forestry problem into parliament. Great Britain has too dense a population and is too small in geographical area to afford hope for a forestry policy that will ever fully supply a native pulp industry or even solve the problem of feeding the people with bread, so that the British paper industry will have to be dealt with as a fiscal question. In Canada and the United States, however, public men are realizing that the forest is our most vital national asset, and their sense of appreciation of the special relation of the pulp and paper industry to the forestry problem has become all the keener since electricity, generated by the water-powers of our rivers, has come to play such an essential part in the maintenance of industries of all kinds.

Leaders of thought in the United States seem to be more thoroughly awake than we in Canada are to the fact that without its forests the country cannot maintain its material power. The recent convention at Washington, called by President Roosevelt, to consider the "conservation of the natural resources contained in the Forest, the Soil and the Mine," show a public conscience as thoroughly aroused as that of the Ninevites of old at the preaching of Jonah. And as if to emphasize the truth of these warning voices they have had in the past month forest fires in the Northern States and drought combined with bush fires in the Southern States and in the region of the Alleghanies that have destroyed millions of dollars' worth of timber, and caused great suffering to live stock and a partial paralysis to the industries of extensive districts. This beginning of woes illustrates the direct effect of the undue destruction of the forests, especially those

that have heretofore clothed the mountain sides from which the water supplies of so many towns are derived.

These demonstrations of cause and effect in the natural world are occurring at a time when tariff reform is once more engaging the thoughts of the people in political life, and the coming elections in November, which ever party is placed in power, will probably be followed by changes in the forestry policy of the United States, and by changes in the duties on paper and pulp among other tariff changes.

That these changes may radically affect the pulp and paper manufacturers is evidently the fear of the leaders in those lines of industry, as a strong committee has been appointed by them to lay before the people and the incoming congress the facts of the situation from their standpoint. The paper and pulp manufacturers, in common with manufacturers in textiles, the iron and steel trades and other chief groups of industry, will oppose any material reduction in the tariff. It must be admitted that the paper and pulp manufacturers present a good case compared with other protected trades, since they are able to show that the average tariff on paper and pulp is only 27 per cent. compared with a general average of 40 per cent. on all manufactures. The paper and pulp manufacturers have the American Newspaper Publishers Association and the Associated Press arrayed against them, the former having for the past three years been appealing to the public and Congress to throw off the duties altogether because of alleged combines to raise prices. The Democratic party has committed itself to declarations in favor of the Newspaper Publishers' appeal, but as the newspaper association has been chiefly concerned with getting on the free list, a material of which they are the chief consumers—namely, news print—and have not broadened their demands into a general principle, it is a question how far their agitation will meet with a response from the people or from the new congress. All the arguments advanced by the Newspaper Publishers' Association in favor of free trade in news print paper can be advanced by the consumers of material in every other trade and industry in the United States; but so far as can be gathered from their editorial utterances not one of the leading organs making the appeal for free paper has come out with a demand for the general application of free trade.

When one reads the arguments and proposals of both publishers and pulp and paper manufacturers in regard either to tariff legislation or a forestry policy one is driven to the conclusion that the only men who could be safely trusted to inaugurate a broad policy for the whole continent of America would be the scientific foresters themselves, for they only can disregard national boundaries or the fleeting and shifting exigencies of trade.

For example, Don C. Seitz, of the New York World, reads a paper before the National Editorial Association in which after anticipating the time when "the $6 a ton tariff [on news paper] is taken off and we are free to go to the best market to secure our raw material," he turns to the forestry problem and presents this solution:—"The disappearing forests [of the United States] ought to have a chance to grow. The Canadian timber lands should be turned into wealth as they should be." In other

words, Mr. Seitz proposes to exercise the greatest care to preserve the forests of his own country while the disappearing act is to be performed on the forests of Canada. But after all one should not condemn Mr. Seitz when the very same proposition, in more adroit words, was recently made in an official statement by President Roosevelt himself.

Turning to the manufacturers, a contribution in the Paper Trade Journal by Chester W. Lyman, assistant to the president of the International Paper Company, sets forth the arguments of those manufacturers, and may be regarded as a semi-official statement, as Mr. Lyman is Chairman of the committee of the American Paper and Pulp Association appointed to deal with tariff questions. This statement is ably presented and in the main reasonable, though as is natural it considers only the interests of paper and pulp manufacturers, and those interests from the American standpoint, only.

Mr. Lyman thinks that when business is good and the demand is equal to the supply, the tariff has little effect on prices, but it is when times are bad that the tariff comes in to prevent outside supplies from glutting a market already congested. "Then it is that every ton of paper or pulp imported increases our unemployed labor and capital. There is now coming into this country a large quantity of Canadian pulp and paper. There are also shipments from Germany, Norway, and elsewhere, although many of our paper and pulp mills are shut down from lack of orders." The writer goes on to state that the duties on paper were substantially the same under the Wilson "tariff for revenue" act and under the McKinley Act; that the duty on ground wood pulp, when reduced to an ad valorem basis, amounts to from 8 to 13 per cent. on chemical pulp about the same; on news print about 15 per cent.; on book paper 15 to 20 per cent.; and on writing paper 25 to 32 per cent., according to grade. The total values of paper and its manufactures imported into the United States increased from $2,838,738 in 1898 to $10,727,885 in 1907, while the imports of pulp increased from $601,642 in 1898 to $6,348,857 in 1907. While the industry has also grown enormously —the output of paper having increased from $10,000,000 in 1850 to $188,715,000 in 1905, competition has been keen, often destructively so. Dealing with the proposition to put pulp on the free list Mr. Lyman says:—"The proposition to reduce or repeal the duty on pulp has no more merit than the similar proposition in reference to paper. The fact is ignored that pulp wood is on the free list. We do not need to import both pulp and pulp wood. It is certainly better for the country to have the latter importd and manufactured here into pulp. The pulp industry is in itself an important one, the amount of pulp made to sell amounting in value to many millions of dollars a year. Pulp is therefore far from being a raw material, and it would be manifestly a discrimination against pulp manufacturers to deny them the same kind and degree of protection accorded to other industries. Moreover, pulp making is a most important part of the process of paper making where the two processes are combined in one plant, as in the majority of cases. It requires proportionately as much capital and labor as the after process of converting the pulp into paper. It would be extremely illogical to cut the process of paper making in two in the middle and provide less protection

for one half than for the other. The Republican platform proposes minimum and maximum schedules, the latter being intended "to meet discriminations by foreign countries against American goods entering their market." This feature of the tariff would not be available in case Canada should continue or extend her discrimination against this country in connection with the exporting of pulp wood. Therefore it would be safer to frame the paper and pulp schedule with the particular end in view of meeting Canadian efforts to transplant the industry from the United States to its own borders. We would like to see in our tariff an "anti-dumping" provision such as Canada has, which practically makes it impossible for foreign manufacturers to sell their surplus in her market at lower prices than those prevailing at home; and the countervailing or retaliatory clause which is now a feature of our paper and pulp schedules, providing an increase in duties corresponding to discriminations by foreign countries in restricting pulp and pulp wood exportation, should certainly be modified to render impossible certain evasions which are now practised. In marked contrast with the Republican programme, the Democratic platform singles out the paper industry for attack in this plank:—'Existing duties have given to the manufacturers of paper a shelter behind which they have organized combinations to raise the price of pulp and paper, thus imposing a tax upon the spread of knowledge. We demand the immediate renewal of the tariff on wood pulp, print paper, lumber, timber and logs, and that these articles be placed upon the free list.' "

Mr. Lyman alleges that this plank originated with certain newspaper publishers who tried to get Congress last winter without investigation to place paper and pulp on the free list. He says wages in the paper and pulp trades are higher in the United States than in any other country, and that if the duty is taken off paper mills must either lower wages or see a large part of the industry transferred to Canada, "which has at least equal natural advantages for making some kinds of paper," and "where without question the industry would have reached much larger proportions but for the fact that our duty upon paper and pulp has given to the United States manufacturer slight advantage."

As to a tariff policy for the United States Mr. Lyman says:—"In the first place there should be no duty whatever on pulp wood. As long as we can get pulp wood free of duty there is no substantial advantage to be gained by having free paper or even free pulp." What Mr. Lyman would recommend if the advantage of free Canadian wood ceased by reason of legislative action by Canada is not disclosed; but he thinks that "if the duty were removed from paper and pulp the United States manufacturers who own timber lands would be compelled to strip them, as they could not afford to continue their present conservative methods of lumbering in the face of competition with Canadian mills."

It seems more and more apparent as the discussion of the subject proceeds that the maintenance of the pulp and paper industry of the United States in its present position depends upon access to the cheap pulpwood of Canada, and that if the industry of the two countries is to develop at the present ratio, that development can only be maintained at the ex-

pense of the available supplies of Canadian wood.

It will be the duty of the Canadian Government to demonstrate the same interest in the conservation of Canadian forests that statesmen of other countries are showing in this most vital of all resources. A common policy on such a question between Canada and the United States would no doubt be to the common advantage, but if such a plan is brought about the manufacturers concerned will have to evince a little more consideration for the interests of those across the border than they appear to do now.

CONSERVATION OF RESOURCES.

Conservation of Resources is now the watchword in the United States; and not before it was sadly needed. The prophet of conservation is Theodore Roosevelt, who looks at the problem not as a question of niggardly hoarding present assets, but from the broader standpoint of the fact that it must be upon the solid foundation of fertility of soil, of a continuance of the very basis of industrial progress, that the coming welfare of the nation must stand. Past wastefulness has already had its effects upon soil fertility; wastefulness not only of the soil ingredients themselves, but of the forests which prevent those ingredients being washed away in alternation with being useless for lack of moisture. Power, that prime necessity of a manufacturing nation, has been similarly affected. The loss of lumber assets, serious enough in itself as it is, is really of secondary importance compared with the two former factors of the waste of soil fertility and the waste of water-power. And these again are overshadowed by the unspeakably bad influence over future generations and on their "legitimate right to make full use of their capabilities for happiness." The President sees these fundamentals more clearly than most, and realizes the terrible danger which now exists of alienating any part of these human capabilities. That is why he has appointed Commissions to enquire into forest resources and power resources, and into any present defects which may exist to prevent the living of the ideal country life; these Commissions to be composed of practical, yet far-seeing men, capable of drawing correct data from the mass of material presented to them.

Some figures presented by H. St. C. Putnam at the recent White House Conference on the conservation of power resources are interesting. Before 1870, he says, the use of water-power in manufactures exceeded that of steam power. Water-power expressed in percentage of the total power employed has since steadily declined, falling from 48.3 per cent. in 1870 to 11.2 per cent. in 1905. During the corresponding period steam power increased from 51.8 per cent. in 1870 to 78.2 per cent. in 1900. The census of 1900 showed a marked falling off in the rate of increase in the percentage of steam power used as compared with the rate prior to 1890, and this was accentuated in the census of 1905, when the percentage of steam power fell to 73.6 per cent. of the total. This check to the ascendancy of directly applied steam power was due to the introduction of electric power. In 1890 electric power was negligible. In 1900 it constituted 4.8 per cent. of

the total. In 1905 this has increased to 11.8 per cent.—a marvellously rapid growth when the aggregate increase of over 1,000,000 horse-power in five years is considered. If the present rate of increase prevails until 1910 electric power will have reached 18 per cent. of the total and steam power will have dropped to 68 per cent. If the same rate of increase is maintained until 1930, electric power as applied to the manufacturing industries will exceed the amount of steam power applied direct.

FOREST FIRES.

The forest fires during the past month in Canada are of a most serious nature, and show that neither Governments nor people are doing what they should to prevent such calamities. The fires in the Crow's Nest region, with the suffering and loss of life involved, the forest fires on Vancouver Island and those to the north of Lake Superior and in Northern Quebec have caused direct losses variously estimated at $15,000,000 to $25,000,000, while the consequential losses through the ruin of the surface soil in many districts burnt out may be even greater than the last-named amount. The unrestricted slaughter of forests for pulpwood shipped out of the country and the neglect that leads to these forest fires will bring the timber famine nearer at hand than we think.

NEWS PAPER AT AUCTION.

John Norris, Chairman of the Committee on Paper of the American Newspaper Publishers' Association, writes complaining that our references in last issue to the failure of his August auction sale in New York City were misleading. The manufacturers are planning to have monthly sales at auction in each of the principal cities. Does this, he asks, indicate that the first sale was a failure? He points out also that at the second sale on the 2nd inst., the total realized was $21,340, the average price being $1.90½, showing a profit over purchase money.

PAPER MADE FROM COTTON STALK.

It has been stated that a good quality of cheap paper can be made from dried cotton plant stalks which heretofore have been regarded as a waste.

The Department of Agriculture, Washington, D.C., has been referred to as carrying on investigations along this line, and in order to ascertain the situation we addressed the department on the subject and have learned from the Forest Service that while the experiments made by the department on the cotton stalks have shown that a pulp can be manufactured which is suitable for many purposes, yet the investigations have not been carried to the extent of converting this pulp into paper of a merchantable quality.

A sample of what has already been accomplished has been sent to us for our examination, and shows a very coarse product which needs very considerable refinement before it can be called a success. The chief of the Forest Service writes us as follows:

"The work is, at present, in rather a preliminary stage, but will be pushed with all possible vigor. I may say, however, that the results have been so successful that one of the prominent paper manufacturers in this country has consented to take up the matter next fall and make several runs on a commercial scale."

PULP AND PAPER NEWS

Kentville, N.S., Boad of Trade passed a resolution that the exportation of pulp and pulp wood from Canada should be prohibited by the Federal Government.

* * *

The earnings of the Temiskaming and Northern Ontario Railway have been affected by the depressed conditions in the pulp market of late, shipments of wood having fallen off very materially.

* * *

The steamer Oregon, owned by J. W. Squires, Chicago, loaded with pulp-wood, ran aground on Dyment Shoal, near Thessalon, Ont. Fire broke out, and the steamer is a total loss. Part of the cargo was saved.

* * *

The New Brunswick Pulp and Paper Company is prepared to purchase spruce pulp-wood on railroad cars along the Intercolonial Railway from Fredericton to Chatham Junction. Contractors are requested to communicate direct with the company at Millerton, N.B.

* * *

The steamer "Esther" arrived from Chatham, N.B., a few days ago in Portland, Me., with a cargo of 1,800 cords of pulp-wood for the International Paper Company. The steamer "Alderney," another of the four steamers employed by that company in the pulp-wood trade, will now be taken off.

* * *

At Montreal on August 18th took place the marriage of Frank X. Gagnon, night superintendent of the International Paper Company, Chisholm, Me., and Miss Corinne Pagnuelo, daughter of J. B. Pagnuelo, and niece of Judge Pagnuelo, of the Supreme Court of Montreal. They took a short wedding tour through Richmond, Quebec and other places.

* * *

W. H Rowley, president and general manager of the E. B. Eddy Company, Hull, Que., is making an extensive trip through the Dominion, keeping in close touch with the company's various branch offices. The idea of establishing a branch factory in the West has not been abandoned. Mr. Rowley expects to return in time for the Canadian Manufacturers' Convention in Montreal this week.

* * *

The work of erecting the large steel and concrete dam on the Chaudiere, which will be of great benefit to J. R. Booth, of Ottawa, the E. B. Eddy Company, of Hull, and several other large users of powers on both sides of the river has been started. The estimated cost will be $500,000. The work is being done by Quinlan & Robertson, of Montreal. The dam will comprise 50 concrete piers, 23 feet distance apart, and the shape of the whole structure will be semi-circular.

PAPER STOCK MARKET REPORT.

Montreal, September 14th, 1908.

There is not much change in prices of paper stock. Quotations range about as follows:—

Unbleached cuttings	$4 00	to	$4 50
White shoe clips	4 50	to	5 00
Colored shoe clips	3 00	to	3 25
Domestic white rags	2 25	to	2 50
Blues and thirds	1 25	to	1 50
Roofing stock	85	to	95
Manilla rope	2 50	to	2 75
Waste papers	90	to	95
Bagging	80	to	85

—Under the Australian tariff brought in a few months ago, manufactures of paper, including price lists and trade catalogues were dutiable at 6d. per lb. There is now an added clause of 35 per cent., whichever rate returns the highest duty. Pulp board for coating has been made free. Tissue cap paper, copying paper and paper for patterns have also been made free.

NEWS OF THE MILLS

The rossing mill at Chatham, N.B., is working day and night.

* * *

The Riordon Paper Company's sulphite mill at Merritton, Ont., is now in operation again. The company states there has been considerable revival of business lately.

* * *

The Campbell Lumber Company, of Weymouth, N.S., have been improving their pulp mill plant considerably of late, putting in three large turbines, also constructing another gate in their dam which is 60 feet in height.

* * *

Chas. B. Campbell, the engineer in charge of construction of buildings for the Gordon Pulp and Paper Company at Dryden, Ont., is making preparations for an immediate starting of work. The buildings are to cost $250,000, besides the machinery.

* * *

The Trent River Paper Company's mills at Frankford, Ont., caught fire a few days ago, but through the efforts of the townspeople it was confined mainly to storehouses. About 40 tons of pulp were burned. Several carloads of paper rags were just barely saved.

* * *

The E. B. Eddy Company, Hull, P.Q., will probably take out only a comparatively small quantity of pulp wood during the coming season. It already has quite a large quantity along the rivers and if this can be got in, they will have almost enough for near requirements.

* * *

J. R. Booth's new sulphite mill at Ottawa is now turning out almost enough pulp to supply the needs of his paper mill, though it is not yet running to full capacity. The water power has been very satisfactory until now, considering the time of the year, and the mechanical pulp mill was running full tilt until last week, when it closed down temporarily.

* * *

The St. Lawrence Pulp and Paper Co., Limited, Ottawa, has been granted a charter authorizing it to carry on a pulp and paper manufacturing business. The capital is $300,000. J. A. O'Brien, of Renfrew, Ont., is president; J. J. O'Meara, barrister, Ottawa, secretary-treasurer; while W. N. Cornell, of Massena, New York, is also interested.

* * *

There is a rumor that the Backus-Brooks syndicate has retired from their water-power and pulp mill schemes at Fort Frances, Ont., and that these projects will be financed by eastern capital. United efforts are being made by the citizens of that place to gain assurances from farmers and others living in the section guaranteeing an ample supply of pulpwood, so as to remove all possible obstacles to the project for building pulp mills. Another report states that the cement for building the dam has already been placed on the ground.

* * * *

It is announced that no tenders of a satisfactory nature were received for the Imperial Paper Mills and pulp limits or the Northern Sulphite Mills at Sturgeon Falls, Ont. The mechanical pulp mill is being operated now by the estate of the Sovereign Bank, but the sulphite and paper mills are lying idle.

* * *

P. M. Hamlin, manager of the British Canadian Wood Pulp and Paper Company, has placed orders with the Dilts Machine Works, Fulton, N.Y., for the beating engine and wet machine equipment of the mills at Port Mellon, B.C. The Dilts rigid stand type of beaters will be installed, and its improved wet machine, similar in construction to the machines installed by them at Chicoutimi, P.Q., is to be used. A 120-inch Fourdrinier machine has already been put in position. The plant now to be constructed will consist of a soda pulp mill and paper mill. This will be added to later by the erection of a large ground wood mill, water-power being available for the operation of a very large plant.

CONSUMPTION OF WOOD FOR PULP

The Washington Census Bureau has issued a pamphlet covering figures for the fiscal year 1907. The chief features of the year in connection with the manufacture of wood pulp were:—

(1) A consumption of wood greater by 301,484 cords than that in any previous year.

(2) The highest average value per cord for all kinds of wood; an increase of 96 cents per cord over 1906, the highest preceding year.

(3) An increase of 186,500 cords in the imports of pulp wood. Of the two woods imported, spruce and poplar, spruce shows a percentage of increase nearly twice as great as that for poplar.

(4) Since 1900 the amount of wood consumed each year for pulp has increased, in round numbers, from 2,000,000 cords to nearly 4,000,000 cords.

Consumption.

In 1907 the consumption of wood for pulp exceeded the high water mark of 3,661,176 cords, reached in 1906, by nearly one-third of a million cords, making the total consumption, by 258 mills, 3,962,660 cords. In the previous year, 1905, the consumption of wood for pulp was 3,192,123 cords, which shows that since that time the consumption has increased over three-fourths of a million cords. The figures for 1907 show a large percentage of increase in the consumption of poplar and balsam. Practically all of the former was reduced by the soda process and practically all of the latter by the sulphite process.

All the other kinds of timber show a normal increase in quantity consumed except the miscellaneous species grouped under the heading "all other.' The decrease of nearly 69,000 cords, or 35.5 per cent., in the consumption of this class of timber, however, is apparent rather than real, as it results principally from the fact that cottonwood was included in "all other" in 1906, but was reported separately in 1907.

In 1900 spruce constituted 75.9 per cent. of all the wood used; in 1905, 71.2 per cent.; in 1906, 68.5 per cent.; and in 1907, 68.2 per cent. It will thus be seen that the proportion of spruce wood used has remained very constant, in spite of the fact that the total quantity of wood used has nearly doubled since 1900 and that other woods have been introduced in large quantities. In the same period poplar, which, with spruce, was used for years to the exclusion of all other woods, has increaesd in total quantity less than 115,000 cords because of its very limited supply. For several years it has been outranked by both spruce and hemlock. Pine shows a greater percentage of increase than poplar, but only a little over one-fifth as many cords of pine were used as of poplar. The 125,162 cords of all other wood used in the manufacture of pulp in 1907 were composed of basswood, soft maple, gum, sycamore, beech, birch, elm, ash, cucumber, sugar maple, butternut, buckeye, and white fir, and other Pacific Coast species. Many of these woods were used in very small quantities, evidently more or less experimentally. Included with the poplar there is without doubt some yellow poplar (Liriodendron tulipifera).

Spruce constituted nearly all of the wood reduced mechanically. Of the amount of spruce reduced by this process in New York, the imported spruce, with 227,358 cords, exceeded the domestic spruce by nearly 9,000 cords.

Three-fifths of all the imported spruce used for ground wood was reduced in New York State.

Sulphite Process.

Of the total amount of wood reduced by the sulphite process, spruce furnished about seven-tenths and hemlock more than one-fourth. Balsam, pine and other woods form an unimportant part of the total. As in the mechanical process, New York leads the individual

States in total consumption, with nearly 500,000 cords, about one-fourth of the total amount consumed by the sulphite process. New England consumed more than one-third of the total amount used in this process. A much larger proportion of the imported spruce is reduced by the sulphite than by the mechanical process. The Lake States consumed more than three-fifths of the hemlock that was used, and Pennsylvania nearly one-fifth. The combined consumption of hemlock in these two regions thus amounts to four-fifths of the total amount used.

From the earliest time for which figures are available, New York has been the leading State, both in consumption of wood and in manufacture of pulp. In 1907 this State alone consumed 990,666 cords, and, while this total is smaller than that for either 1906 or 1905, the showing results from a slightly different method of handling the statistics for New York and New England for those years, when the consumption of certain mills located in Maine, Vermont, New Hampshire and Massachusetts, but operated and reported from a general office in New York, was included with that of mills under the same management and located in the latter State. In the statistics for 1907 the figures were segregated and distributed by States. This accounts for the apparent decrease in New York, and also in part for the relatively large gain in New England.

The average price per cord of wood in 1907 ($8.17) is nearly a dollar higher than in 1906, and exceeds the price per cord in 1905 by $2.61. It should be noted however, that in both 1906 and 1907 manufacturers were asked to report the cost per cord at the mill, while in 1905 they were asked to report the cost at point of shipment. This, in a measure, accounts for the great difference in the reported cost of the raw material. The highest average price per cord obtained in New York. New England ranked second in this respect and the Lake States third. The lowest price ($6.90) is credited to Pennsylvania. The average price per cord of wood used for pulp has always, during the past three years, been highest in New York, while generally it has been lowest in Pennsylvania.

The increasing cost of pulp wood and in some cases the difficulty in obtaining a sufficient supply have greatly stimulated the search for other materials for making pulp, and at the last session of Congress $10,000 was appropriated "to enable the Secretary of Agriculture to test such plants as may require tests to ascertain if they be suitable for making paper." Investigations are now in progress under the authorization given by this appropriation.

The greater increase is for the wood reduced by the chemical process, and nearly twice as much wood is now being reduced in this manner by the mechanical process. The increase since 1900 in the amount reduced by the mechanical process has been 73 per cent., as compared with an increase of about 125 per cent. in the amount reduced by the chemical process. The amount of pulp reported as obtained from a cord of wood varies greatly with the local conditions, and depends on the process employed, the species of wood, the conditions when weighed, and the machinery used. A cord of wood reduced by the mechanical process is reported as producing from 1,500 to 2,400 pounds of pulp, with an average of about 2,000 pounds. Where the chemical process is employed, from 900 to 1,200 pounds of pulp per cord of wood is the amount generally reported. In view of this smaller product per cord obtained by the chemical process, it is probable that the total quantities of pulp produced by the two processes are approximately the same.

All the wood imported into the United States for the manufacture of pulp comes from Canada, duty free. The amount has increased from 369,217 cords in 1900 to 925,373 cords in 1907. Since 1906 the imports have increased over 25 per cent. Although only two

kinds of wood, spruce and poplar, are shown in the returns as being imported for pulp, a small quantity of balsam was also imported in 1907 into New England and New York.

Spruce has formed the principal part of the imports, constituting 94.5 per cent. in 1900 and 97.9 per cent. in 1907, and for this reason the total percentage of increase in imported wood corresponds very closely to the percentage of increase in spruce.

The mechanical pulp carries a duty of one-twelfth of a cent. per pound, or about $1.67 per ton; the unbleached chemical pulp, a duty of one-sixth of a cent per pound, or about $3.33 per ton, while the bleached chemical pulp carries the highest duty of all, one-fourth of a cent per pound, or $5 per ton. Mechanical pulp, which is used in making news paper, constitutes a large proportion of the imported pulp. The bleached chemical pulp, most of which comes from Scandinavian Europe, constitutes less than one-fifth of the imports.

DURABILITY OF PAPER.

The durability of any paper will be dependent on the following points: The raw material from which the paper is made; the treatment which the material is caused to undergo in the course of manufacture; the residues of foreign matters unintentionally left in the paper after manufacture or added intentionally for specific purposes; the wear and tear to which the paper is subjected when in use; lastly, the conditions which prevail in the place in which it is stored when out of use.

The oldest authentic papers, made from rags, which Professor Kirchner has examined, date from the fifth century A.D., and are of Chinese origin. These are composed of a mixture of more or less raw blast fibres of the paper mulberry and probably ramie fibres, which are not very much beaten, with linen rag fibres beaten very strongly until almost unrecognizable. The papers are soft and very long fibred, and of a yellowish white color.

The next series of papers are of Arabian manufacture, dating from about 1300; these are made from linen rags and the fibres differ from the rag fibres in the Chinese papers in the fact that the effects of beating are very slight.

Next come some Italian papers of about the year 1600, in which the linen and hemp fibres employed are considerably more beaten than in the Arabian papers, but not nearly so much as in the Chinese.

As regards the condition of beating, the strongest modern German papers resemble the original Chinese papers more closely than the others. Professor Kirchner concludes from these papers that the degree of beating of the fibres, in the case of linen and hemp rags, has no influence on the durability of the papers. The fibres, which are absolutely beaten to shreds, give just as durable papers as those which have been preserved almost unchanged by the beating process. A comparison of papers of different origins and ranging in date from the eleventh to the sixteenth centuries, shows differences of color which may be traced to the mode of chemical preparation.

Starting with the Arabian papers of the eleventh century, Professor Kirchner notes that all papers in which the rags had been macerated with lime and bleached in the sun, and which have been sized with starch, have become strongly discolored in the course of time, and in many cases rotten. On the other hand, many European papers of the fourteenth and fifteenth centuries are white, and nearly as good as new; in these papers the rags had merely been prepared by washing in water. From the sixteenth century onward, alkaline treatments came into vogue in Europe, and the papers have become discolored like the Arabian papers. A

series of Saxon papers of the sixteenth century show this defect very strongly, and it is probable that the rags at that time were not only treated with lime, but also subjected to a fermentation process, which has likewise contributed to their lack of durability. Mild preparatory treatments of the rags without chemicals and animal sizing of the paper are the conditions which have yielded the most permanent papers from the Middle Ages.

No amount of care in manufacture, of course, can protect a paper from the accidents of its environment. Many of the old papers have suffered from the attacks of mice and worms, but the agency which has been most destructive is damp. However good the paper may have been, storage in damp rooms will bring about its destruction by mildews and similar growths.

Coming down to comparatively modern papers, Professor Kirchner does not take a very hopeful view of their durability. Even in the case of rag papers, durability of the same nature as that of the ancient papers is hardly to be expected. The general unlimited use of chemicals, alkalis and bleaching powder, not only in the paper mill, but before the rags come to the paper mill, must have caused a change in the character of the raw material of modern as compared with ancient tissues. The "rag substitutes," i. e., chemically prepared half stuffs, have probably lowered the standard still more, and the almost general practice of rosin sizing is another factor which will tell against durability. Many samples of the finest grades of sulphite wood pulp, prepared ten to twenty years ago have become quite discolored; a case is quoted where a bleached sample of pulp is now, after fifteen years, considerably darker in color than a sample of the same pulp unbleached. A sample of printing paper dated 1875, which was supposed to represent the best production of a renowned fine paper mill, is now yellow and brittle.

On the other hand, among a large number of similar bad results, Professor Kirchner possesses other samples of modern papers of the last fifty years which are as good as new. A collection of papers furnished by the C. D. Ekman Company in 1888, made from Bergvik wood pulp, are as brilliant and strong after twenty years as when they were made. Other papers, both rag and chemical pulp papers, show signs of an equally good durability.

Given that some modern papers apparently fulfill all the conditions of durability, while others supposed to be of equal quality fall to pieces in a few years, what is the reason of the difference? This is the problem which is under study at the Prussian Government Testing Institute, and for the solution of which Professor Hertzberg has appealed for samples of paper to be deposited in the archives, together with the fullest particulars of the methods employed in their manufacture.

—The Kellner-Partington Paper Pulp Company, Limited, of London, which has large pulp and paper factories in England, Sweden and Austria, and of which Edward Partington, J.P., is a director, is offering £400,000 4 per cent. mortgage debenture stock to the public, being part of a total authorized issue of £650,000.

—An American consul in Canada states that a business man in his district advises him that he has a number of timber and pulp wood tracts for sale, and would like to be put in touch with American firms interested in the same. Replies to be addressed "Inquiry No. 2,499," Bureau of Manufactures, Washington, D.C.

DRIVING PAPER MACHINES.

In a recent article in "Papier-Zeitung," Dr. Carl Hofmann remarks that every paper machine can only drain and dry a certain quantity of material in a minute, being able to run quickly on thin paper, but having to go more slowly when thicker grades are being reduced. Hence frequent variations of speed are necessary where nearly uniform weights are not made. Quick running machines, all working at the rate of some 500 feet a minute on news, must as a rule be so arranged that they can produce paper three times as thick at one-third the speed. The old principle that each paper machine should have its own motive power independent from that of the rest of the plant is said to be still applicable.

Dr. Hoffman considers the most economical and suitable drive is by the high pressure steam engine, the speed of which can without trouble be considerably varied, the exhaust steam being used for drying.

As new large paper machines require a motive force up to 300 horse-power, it is recommended to drive the parts whose speed is not to be altered by a special motor and the other parts by a different and larger motor, the exhaust steam being in both cases conducted into the drying cylinders. Should the exhaust steam prove insufficient for drying it can be supplemented by the automatic introduction of live steam, the maximum of convenience and economy of making being thus attained.

USE OF CHINA CLAY IN PAPER MAKING.

The mining and refining of clay is one of the principal industries of Cornwall. The glistening piles of white quartz on many of the hill tops is a very common sight. The clay is mined in open pits by the use of water. These deposits, being the product of the slow disintegration of feldspar, are composed of 25 to 30 per cent. clay, and 70 to 75 per cent. coarse quartz and sand. This larger proportion of refuse so conceals the fine clay that one unfamiliar with the conditions would fail to observe the clay unless he made a careful examination.

The process of mining consists in washing the clay from its bed by means of a stream of water, which is led in sluices along the top of the banks and discharged over them. The water searches out the fine clay and sand, carrying them along to one of two or three settling sluices, where the coarser material deposits and the clay and fine sand flow on to a well, where, by means of a crude wooden lifting pump, it is raised to the top. Here it is distributed to a system of "micas," as they are called, or as we may say riffling sluices, where the final settling out of the very finest sand takes place and the effluent clay is led away usually in open sluices and frequently shallow ditches in the earth to the huge open reservoir to settle and the water is tapped off. These settling basins are situated close to the drying sheds.

Where there is a scarcity of water these must be located so that the surplus water can be led back over the bank of the pit and used again. When this is not necessary the flow of clay water from the "micas" may be led some distance where there are conveniences for shipping, which makes some saving in the cost of transportation, but does not result in a corresponding advantage over other less favored shippers in this particular, as the lands and mines are not owned by the clay producers who are only tenants of the great titled landlords, to whom a fixed royalty per ton for the privilege of getting out the clay is paid, and this royalty is modified by the accompanying natural advantages so that a producer, whose carriage charges to point of shipment are small, will pay a greater royalty than one who must haul his product with traction road engines or teams some distance to ship.

Returning now to the clay pit, we observe that to get a good product its exposed surface must be kept cleaned up by the continual removal of the coarse quartz and the breaking up of the little channels of water flowing over the banks, to find new sources of clay and to facilitate the carrying of the sands into the coarse settlers in the bottom of the pit. This waste is hauled up the sides of the mines by means of two cable cars and hoisting engines, and run off on the dump. This constitutes one of the principal items of labor and expense.

The Kiln and Packing Shed.—This is located close to the settling basins and is a rough, wooden structure, 150 to 200 feet long, with a roof enclosed on one side. The other side is left open for the escape of the vapor and for the convenience of packing and loading.

The method of drying the clay consists in running the thick clay sludge from the settling basins on to a tile drying floor. The heat for drying is furnished by burning coal on grates at one end of the shed and conducting it through flues under the drying tile. The chimney is located at the other end of the shed. When sufficiently dried the clay is shoveled out and packed into casks ready for shipment. The drying process must be conducted with great care, as these clays contain about 12 per cent. chemically combined water which would be partially set free by overheating, resulting in loss of plasticity and inferior color. By this method of drying it is not practicable to get a produce of uniform content of moisture. The clay nearest the fires will naturally dry quicker and contain less moisture than that farther from them.

The average moisture in English clays has come to be recognized as 10 to 12 per cent. Drying clay in the manner described gives a product containing from about 7 per cent. to about 18 per cent., averaging 12 to 14 per cent. To avoid the differences which must arise between producer and consumer regarding moisture, if clay were sold by actual gross weight, a cask of certain standard dimensions was adopted to hold a certain number of cubic feet and to contain half a gross ton with the average customary allowable moisture.

It was found that a variation of 8 to 10 per cent. in the moisture content had no practical influence on the bulk of the clay when packed in the same way; that is, casks of the same capacity when packed with the same care, in the one case with very dry clay containing 8 to 9 per cent., and in the other 14 to 15 per cent. of moisture, when weighed up and their weights corrected by the customary moisture allowance would in each case contain the same amount of clay. The gross weights of the casks would, of course, vary widely. Until this question was thoroughly tested out to my satisfaction, I was frequently under conviction that the company for which I acted was paying for excessive moisture. The clay is always invoiced two casks to the ton, and no actual weights given, as none are ever made except by the United States customs officials. The carriers have always accepted two casks to the ton regardless of actual weights. So far as I know no standard of moisture has been fixed except by custom and precedent.

In order, therefore, to test a shipment of clay for moisture and to determine if the capacity usage of the shippers is reliable as to actual deliveries it becomes necessary to take the net weight, and a sample for moisture from each cask, applying the results to their respective casks and correcting for customary moisture. I have at various times tested invoices of clay in this way, with the result that while there was a great variation in the weights and moisture contents of individual casks, the agreement in the actual amount of clay in each was remarkably constant. By this I do not mean that the casks averaged up to close a half ton, but that each held one-half a ton, regardless of actual weights and moisture. There can be no doubt as to the intentions of the English shippers to make a good delivery of one ton of clay in two casks, and if they did not do it our paper manufacturers would see to it that they paid only for what they got.

The small amount of clay which is refined in this country by floating, is dried in a very different manner and runs more

uniformly in moisture, but I am convinced that the present methods in vogue in England are best suited to their conditions.

In this connection, it is proper to refer to the decisions of the United States Circuit Court bearing upon this question, which was published in your issue of April 18th. It is surprising that the importers did not make their case plain to the court. Most of the facts appeared in the discussion, but their proper connection does not seem to have been established. It is true that the greater proportion of the clay will contain more than 10 to 12 per cent. of moisture, and the net weight exceed 1,120 pounds to the cask, and this is the established custom, in the words of the court, "in the ordinary commercial condition, and contains no more moisture than is almost invariably found in any shipment," but the condition as to moisture is well understood by the shippers and is conditioned by the process of refining and the nature of the clay as noted above, and it should be understood by the importers and consumers, who must realize that they are getting what they pay for if they follow up details carefully. The consumers are not paying for nor are they asked to pay for this excessive moisture, and it was to obviate this very thing that a cask of standard dimensions was adopted, and for the existing conditions it has been reliable as to deliveries and fills an important want.

I venture to say that in casks of standard dimensions it would not be possible for unscrupulous shippers to defraud the Government, as the casks are rated at their maximum capacity, and I would suggest the gauging of the casks by the Government as being much fairer and in harmony with the conditions of shipment and at the same time accurate. If the importers had secured the evidence which they might have done and presented it to the court it is more than probable that a different decision would have been reached, and if they do not do it in the future the manufacturers should in their own interests.

The case is analogous to the importation of ground wood pulp subject to duty. Here we have a commodity which is delivered containing about 50 per cent. water, with a 10 per cent. allowance for atmospheric moisture. It is not practicable to deliver this kind of pulp dry from its very nature and have it satisfactory. No one would consider levying a duty on such pulp based on its gross weight.

SWEDISH KRAFT PAPER.

In Kraft paper making the chief point to be observed is to select the proper wood pulp, and to treat it with the lye which is best for the purpose, says an exchange.

The pulp for this kind of paper is now prepared almost solely by the sulphate process, whether the color of the finished product is to be light or dark. Hence it is important carefully to observe the natural color of the pulp, and to supplement it in a proper way, if that is necessary. The natural color is either light or dark, so that for the production of intermediate shades Cassel earth (Vandyke brown) or ferrous sulphate, in quantities corresponding to the shade required, are used. In all cases it is essential that the pulp should not be closed too much. Unless the fibres can be separated by means of a blunt edge, such as that of a paper knife, it is impossible to obtain a good result. For Kraft paper the wood fibres should be used in uniform lengths. The exact length is also of importance, but about an inch and a half is the best length. It must not be forgotten, however, that for special papers shorter lengths are employed.

The stuff ground in the pug mill goes to the hollander, when, after careful brushing, and combing, without any further grinding it acquires the proper consistency to enter the paper machine.

Kraft papers which are smooth on one side only require special attention on the part of the machinist. With thin

qualities it is most important to use plenty of water on the machine wires, and the wringers and pressers must work with a carefully regulated amount of force, neither too great nor too small. The doctors require careful adjustment.

The lower felt must be as penetrable as possible, and the upper cloth must not be too thick. The heat, too, must be moderate, so as to avoid blistering. Watermarks are usually produced with the under cloth; sometimes, hoewver, with the over cloth, sometimes with an intermediate felt. The production of watermarks with the dandy roll is seldom resorted to with this class of papers, and only in special cases, as the character of the stuff and the size of the mesh generally forbid this method. Chinese watermarks also are produced on this class of paper. Decke Kraft papers are best prepared with horizontal vats, although vertical vats also give good results.

The method of the production of Kraft paper smoothed on both sides is nearly the same. The German four cylinder machine gives most excellent results, because it is adapted to all thicknesses of such papers. The wet felts must not be too fine, and in drying the wood felts are to be preferred to cotton felts. The machine must not be hurried, or blistering and waste of material are sure to happen. Any waste added must be put in at regular intervals, and in equal small quantities, so as to preserve a uniform rag paper like appearance. Cross cutters are best for these papers, especially the thinnest.

When we consider that Kraft paper has a less specific gravity than all other second rate papers, it is a matter of wonder that good paper pulp is not more often used for its manufacture. There is no doubt that there is a great future in store for this kind of paper, and the efforts now being made in America and England, as well as in Germany, to increase the output of it are a sign that these possibilites are now being recognized.

LAURENTIDE PAPER CO.

The Laurentide Paper Company held its annual meeting in Montreal on the 25th ult. According to the annual report, the company had a gross business last year of $429,779, against $500,286 in 1906-1907, and net profits of $251,458, against $283,321. Owing, however, to the big surplus carried forward from 1907, the company shows a surplus this year of $286,425, against last year's $242,967, and is therefore in a very strong position, the shrinkage in profits being comparatively small. A comparison of the chief items shows:

	1908.	1907.
Carried forward . . .	$242,967	$159,645
Profits for year . . .	251,458	283,321
Totals	$494,425	$442,966
Dividend, common. .	104,000	96,000
Dividend, preferred .	84,000	84,000
Depreciation	20,000	20,000
Surplus	$286,425	$242,967

The company's assets are $5,321,644, against $5,159,843 at last report. Banks loans are $853,000, against $724,000 in 1907, while accounts payable this year are some $3,000 less. Accounts receivable are about the same, at around $325,000. Sir William Van Horne, the president, in his report, says that the company has added 261 square miles to its timber holdings, at a cost of $91,000, which has been charged to capital. In view of the world-wide depression, the results of the year's business are considered satisfactory. The retiring board consisting of Sir William Van Horne, Mr. Richard B. Angus, Mr. James Ross, Mr. Charles F Smith, Mr. Charles R. Hosmer, Mr. Edwin Hanson, and Mr. George Chaboon, Jr., was re-elected. Sir Wm. Van Horne was re-elected president, and Mr. George Chaboon, Jr., vice-president.

—Several of the International Paper Company's mills in Glen's Falls and other places in New York State are reopening.

NEW CELLULOSE CONSTANTS.

W. Viewig recently read before a German pulp and paper chemical society a paper under the above title. Constants are numerical expressions of properties which enable bodies to be compared with reference to the properties so expressed, and serving, therefore, to identify the bodies. Examples of such numerical expressions are specific gravities, boiling points, etc. Unfortunately cellulose has very few properties which can be numerically compared with the same properties as exhibited by other substances, and fewer than almost any other organic body. The result is, contrary opinions as to nature, whereby not only the scientific investigation of the body is hindered, but its use in industrial pursuits is attended with many uncertainties and irregularities. The more constants we have for a given substance, the better we know it, for similar constants may be numerically equal in bodies known on other grounds to be very different. Thus the specific gravity of 1.54 is common to cellulose and starch, as is the chemical formula $C_6H_{10}O_5$, and yet the two bodies are totally distinct.

The constants so far in use as regards cellulose are eight in number, viz. :—

1. The specific gravity about 1.54.

2. The dielectric coefficient of cellulose hydrate (viscose). This is 7.5, meaning that viscose is 7½ times as good as air as an insulator.

3. The chemical composition expressed by the formula $C_{12}H_{20}O_{10}$.

4. The conversion of cellulose into dextrose by a mineral acid yields ten parts by weight of dextrose for every nine of cellulose, according to the equation—

$$C_6H_{10}O_5 \times H_2O = C_6H_{12}O_6.$$

5. The chemical properties are constant in their limit values only. For example, with nitric.

6. When cellulose is combined with sodium and the caustic soda solution used contains not less than 16 grammes of sodium per 100 c.c., or more than 24 grammes, the compound has the formula $C_{12}H_{19}O_{10}Na$.

7. Cellulose has few solvents. The only ones of practical value are ammonium cuprate, and the xanthogenic acid formed by the action of caustic soda lye and bisulphide of carbon on the carbohydrate. The resulting compounds have definite and constant formulæ, $C_6H_{10}O_5Ca$ and $C_6H_{10}O_5NaHO_2CS$ respectively.

8. The water content of cellulose has to be regarded from two points of view, as it is partly water of hydration and partly water absorbed hygroscopically from the atmosphere. The latter is completely dissipated at 100 deg. C., and if the cellulose has been exposed to air saturated with moisture amounts to 9 per cent. The former is difficult to get rid of, and can only be estimated quantitatively by burning the cellulose or dissolving it in boiling toluol. Its amount in mercerized cellulose corresponds to the formula $C_{12}H_{20}O_{10}H_2O$.

Now, there are celluloses which agree perfectly in all these eight points, but which are clearly distinguished in other ways; for instance, by their affinity for soda and by the extent of their reducing action or Fehling solution. Hence, two new constants are required, a mercerization number and a reduction number, and these have been worked out only within the last year.

Cellulose is affected by three different kinds of chemicals—alkalis, acids, and oxidizing agents. Alkalis confer upon it increased chemical affinity, as shown in the enhanced power of reacting with dyes. The product is called hydrate-cellulose, while that resulting from the action of acids is called hydrocellulose. The hydrocelluloses reduce Fehling. This might have been expected, as the ultimate action of acids on cellulose is to convert it into grape sugar. Oxidizing agents introduce extra hydrogen into the cellulose molecule, whereby its affinity for dyes is increased, and at the same time its reducing power is made greater. The products formed are called

oxycelluloses. We now proceed to the consideration of the two new constants proposed.

Mercerization Number.—Cellulose absorbs different amounts of sodium according to the concentration of the mercerizing lye, and the maximum is reached with a 16 per cent. lye. The action probably involves a depolymerization of the cellulose molecule. The constant is got by determining how much soda is taken up from various 2 per cent. lyes by 100 grammes of cellulose. Stronger lyes gave the following results:—

	Grammes.
NaHO taken up from 4 per cent. lye.	1.0
" " " 8 per cent. lye.	1.4
" " " 12 per cent. lye.	1.8
" " " 16 per cent. lye.	2.8
" " " 20 per cent. lye.	2.8
" " " 24 per cent. lye.	2.8

The practical determination of this constant is carried out as follows: 200 c.c. of the 2 per cent. lye are put into a half-litre stoppered flask, and then 3 grammes of dry cellulose. After a quarter of an hour's shaking, the lye is poured out and its reduced strength determined. Let 50 c.c. (one-quarter of the original amount be taken for through determination, and suppose that 50 c.c. of the acid used in titration corresponds to 50 c.c. of the original lye. Then, if 50 c.c. of used lye correspond to 48.9 c.c. of the same acid, the constant is given by the following equation:—

$$C = \frac{(50 - 48.9 \times 4 \times 2)}{3} = 2.9$$

Reduction Number.—This is the weight of copper reduced from Fehling solution by 100 grammes of the cellulose. The following table gives three mercerization and three reduction constants:—

	Merserization Number.	Reduction Number.
Cotton wool	1.0	1.6
Sulphite cellulose ...	1.2	3.9
Mercerized cotton ...	4.0	1.1

NEW WOODS FOR PULP.

Eastern scrub pine, loblolly pine, lodge-pole pine, California white fir, Groland fir, Englemann spruce and western hemlock all furnish material for print paper, says Dr. H. Stanley Bristol, chief of the section of wood chemistry of the United States Forest Service. He says that of all the spruce cut sixty-eight per cent. is used in paper making and at the present rate of consumption the nation's supply of spruce will be wholly exhausted in twenty-five years.

In some states, Dr. Bristol says, the spruce will give out much sooner. Basing his estimates on the consumption in 1906, he figures that the spruce in Pennsylvania and Minnesota will be gone in nine years, in Vermont in eleven, and in New York in eight and a half years. The forests of Maine and Newhampshire, he thinks, will last about twenty-five years longer. The consumption of pulp wood in the United States last year was 3,600,000 cords. The waste is enormous, Dr. Bristol says. Great slabs that might be useful at the pulp mill are burned merely to get them out of the way.

In order to learn what other woods can be used to take the place of spruce in paper-making the Forest Service installed a little mill.

The material is barked by hand and sawed into disks five-eights of an inch thick, with the grain. These disks are then chipped with the grain by means of a suitable machine. A weighed quantity of the wood is taken for the cook, and another sample of the material for the determination of the moisture content. Sulphite liquor is prepared, using a good grade of dolomite lime, but instead of sulphur burners and the complicated absorbing apparatus used in actual commercial practice the Forest Service uses liquid sulphur dioxide, as being more convenient.

The chips and acid are then placed in a small digester and live steam is supplied. The cook is blown in the usual

way, the pulp allowed to drain and the whole batch weighed. The moisture content of the pulp is then determined and the yield computed. After this the pulp is screened and the yield of screenings determined. Microscopic examinations of the fibres, including determinations of the length and breadth are made, and bleaching tests carried out.

From these experiments Dr. Bristol says he is enabled to furnish the paper makers of the country with data as to the quantity of sulphur and lime required per ton of pulp and much other valuable information, which saves the paper makers from the necessity of carrying on expensive experiments in their commercial plants.

"These experiments," explained Dr. Bristol, "have clearly shown that there are many woods which can be reduced by the sulphite process and made to produce a fibre which in some instances is the rival of spruce fibre. Of the seven species of material other than spruce from which excellent news print can be produced I think the white fir of California is the best."

OVERBLEACHED CELLULOSE.

For an examination into the bleaching of pulp it is very desirable to possess some method for determining the extent to which the bleaching has progressed. If cellulose be "overbleached" a small amount of chlorine derivatives is produced, but the chief products of the reaction are substances related to oxycellulose. If the bleach has been carried out with the aid of mineral acids there is a further possibility of hydro-celluloses having been formed. I have endeavored to use the reducing power of these substances as a means of identifying them. It has been found that the difference in the reducing power of "normal bleached" and "overbleached" sulphite-cellulose is so great that from it the extent of the bleach may be ascertained. The values found for the reducing power of hydro-oxyand hydrate-cellulose may well be used for the chemical distinction of these little known varieties of cellulose. The values given in the table were determined as follows:

Water: A three gram sample of the cellulose was dried in a toluol oven. As cellulose undergoes a chemical change at 90 degrees C, the "reducing power" should not be determined in this same sample.

Reducing Power: In a second weighed, air-dry sample a determination of the reducing power is made and calculated to 100 grams of absolutely dry cellulose. The details for the determination of this "copper number" are as follows: A sample of about three grams of air-dry finely divided cellulose is treated with 200 ce. water and 100 ce. of Fehling solution. Heat this mixture and maintain at the boil for fifteen minutes. The liquid must be stirred constantly in order to prevent bumping. The evaporated water should be replaced in order to keep the concentration constant. The most suitable apparatus was found to be that suggested by Gnehm,—a round-bottomed flask with centrifugal stirrer and reflux condenser. After the liquid has been properly boiled it is filtered by means of a suction flask, using a hardened filter. The residue is washed with boiling water until no copper can be detected in the filtrate. The residue on the filter will consist of a fibrous mass having a more or less intense red-brown color, depending on the reducing power of the cellulose used. The cuprous oxide is removed by treating it on the waterbath with dilute nitric acid (30 cc. of a 6.5 per cent. acid). The bluish solution is passed through a hardened filter, washed with boiling water and finally concentrated so that it may be subjected to electrolysis in a platinum dish. The simplicity of the electro-analysis makes it preferable to the volumetric method. With the aid of a rotary anode the electrolysis may be completed in from 30 to 60 minutes. If like conditions be maintained the results agree very well, as, for

example, in the case of a sulphite cellulose.

Reducing Power of Various Celluloses.

Experiment	Material	Cop. Nos.	
1	Absorbent cotton	1.64	1.8
2	Mercerized cotton, maco yarn bleached and beaten	1.9	1.6
3	Imitation Silk "Glanzstoff"	1.1	..
4	Hydrocellulose (from absorb. cotton filter paper)	5.2	5.8
5	Parchment paper, ground	4.2	...
6	Sulphite cellulose, bleached pulp	3.9	3 9
7	Cellular mucilage "Pergamyn"	3 5	3.0
8	Sulphite cell-matter, over-bleached pulp	19.3	...
9	Oxycellulose prepared from filter paper	7.9	7.6
10	Bleached cotton (pulp from rags)	6.5	5.6

Number one represents one of the purest forms of cellulose. The copper number shows that the bleaching process has wrought a chemical change, even though it be small, for pure cellulose is generally said to have no reducing power whatever.

Number two is a technical, mercerized cellulose made from bleached maco yarn. In order to dissolve the much twisted fibrils and so allow the Fehling solution to penetrate more thoroughly it was ground in the beater. The mercerizing process has increased the reducing power only slightly.

The figures obtained give rise to a doubt as to the technical nature of the change which takes places on mercerizing cotton. In the case of an imitation silk,—"Glanzstoff,"—the copper number is still smaller. The exact determination of the number could not be made at this time as the imitation silk seems to form a blue copper compound with Fehling's solution. The same thing was observed in the case of absorbent cotton mercerized without tension. The copper numbers of these two last named substances are apparently quite close to one another.

Hydro-cellulose proved to be quite different from either hydrated cellulose or mercerized cellulose so that Osts's surmise that hydro-celluloses and cellulose-hydrates are identical is probably not correct. Our work on the various hydrated-celluloses will soon determine whether there is a sharp difference between the cellulose hydrates obtained with the use of alkalies and the hydro-celluloses obtained from the action of acids. Parchment paper seems to be on the line between cellulose hydrates and hydro-cellulose.

A comparison of the values from a bleached sulphite cellulose and a sample of "Pergamyn" prepared in the beater shows that the difference in the reducing power is insignificant even though the physical state of the two products is not at all similar.

It was formerly supposed that the formation of "cellular mucilage" was accompanied by hydration, but Hoffmann has shown that sulphite pulp and the mucilage prepared from it give the same sugar values after being hydrolized. Hoffmann, therefore, concluded that sulphite pulp and "Pergamyn" must have the same chemical nature and that no hydration had taken place. The figures given in the table would at first sight seem to strengthen this point of view. If we, however, consider that there is but a slight difference between mercerized and unmercerized cotton (see the copper numbers), and that analysis has shown that hydration has taken place, we can see that the absence of chemical differences does not indicate anything concerning the state of hydration.

The copper number of the "over-bleached" cellulose is rather striking when compared with that of pure oxy-cellulose. Nastukoff prepared this oxy-cellulose from filter paper and chloride of lime solution. It was purified by dissolving it in caustic soda and reprecipating it with acid. The purifying operations cause the copper number to decrease decidedly. It is probable, as Bumcke and Wolffenstein have emphasized, that certain oxy-celluloses such as Hydral-cellulose are split up by caustic soda into cellulose (an alcohol) and acid-cellulose (an acid). This reaction takes place very rapidly at the boil, but is incomplete at ordinary temperatures so that the solutions in caustic soda yield celluloses with reducing properties.

The tenth experiment shows that cellulose which has been used in the house-

hold and then made up into pulp has undergone a certain chemical change with the resultant formation of oxy-, and hydro-cellulose.

INFLUENCE OF METHODS ON QUALITY.

The enormous influence of methods of manufacture, independently of the nature of the raw material, has long been recognized in a perfunctory sort of way. Quite recently, however, some tests made at the Royal Material Testing Station at Gross Lichterfelde, has crystallized the question into arithmetical results. The chief of the paper testing department, Professor Herzberg, has issued the following instructive report.

In the manufacture of two wrapping papers submitted for examination, A and B, A was made from pulp which had been ground for twice the time that had been devoted to B. The only difference in the grinding was in the time occupied. On the other hand the presses used for A exerted only a comparatively small pressure, so that the paper retained a loose texture, whereas B was subject to a far heavier pressure. Hence A was less felted than B. The table herewith gives the results obtained in testing the respective strengths of the two papers.

Paper	Parallel to the Length of the web.			Across the Length of the web.			Average.			Weight per square metre	Thickness of the paper
	Self-breaking length. Metres.	Elongation. Per cent.	No. of Folds in round Nos.	Self-breaking length. Metres.	Elongation. Per cent.	No. of Folds in round Nos.	Self-breaking length. Metres.	Elongation. Per cent.	No. of Folds in round Nos.	Grammes.	Millimetres.
A.....	5,200	3.1	13,000	2,500	8.1	13,000	3,850	5.6	13,000	155	0.19
B.....	7,600	3.0	10,000	5,400	7.8	4,000	6,500	5.4	7,000	140	0.14

These results show that the method of manufacture affects the strength greatly, B being much stronger than A, but the elongation very little, as the stretch of the paper before tearing is practically the same for both the specimens tested.

CELLIT.

A German chemist has lately perfected a process which brings into competition with celluloid a new composition possessing similar plastic and elastic properties, but free from the easy and somewhat dangerous combustibility common to celluloid articles.

A few years ago the chemist obtained a cellulose acetate or acetyl-cellulose by the action of acetic acid on cotton and other forms of cellulose which possessed a high degree of compactness and toughness, but for which there was no specific technical application. Now he has succeeded in producing another form of cellulose acetate, named cellit, which is endowed with distinctly valuable properties.

It is easily soluble in such solvents as alcohol or acetic ether, which do not seriously affect the health of workmen; and, what is more important, it combines with camphor exactly as does gun cotton, yielding plastic masses, quite similar to ordinary celluloid. Camphor can be replaced by other organic substances, and the resultant products range from hard and tough to soft, leather-like, even rubber-like compositions. All of these varied forms of cellit are perfectly transparent, totally unaffected by water, free from brittleness, and, above all, not readily combustible. Some varieties do not burn at all. Others burn in a flame, but combustion ceases when the flame is removed.

The different properties of cellit are characteristic of glass, gelatin, celluloid, leather and rubber, and it is capable of

replacing each of these materials for divers purposes. Probably new technical applications will soon arise, as we have lacked hitherto a substance at once transparent as glass and pliable as a woven fabric.

It would seem to lend itself admirably for decorative effects, as it can be molded like crystal or receive the delicate imprint of the finest designs. The sheets of cellit, as it is called, are prepared in all degrees of hardness for the purpose of receiving impressions. The results sometimes resemble enamel, again fine leather, or entirely novel effects are evolved. Especially interesting are the specimens of patent leather and of linoleum coated with cellit. The designs of the linoleum are not printed on the surface of the tissue, but are part of the transparent cellit coating with greatly enhanced effect.

Cellit insulation for electric wires combines the advantages over the present materials of cheapness and more attractive appearance, while occupying less space.

A distinct field exists for cellit in preparing waterproof, airtight containers for perfumery, bonbons, etc.; in meeting many needs of the bookbinder and of the surgeon; in the manufacture of toys, fans and various articles of domestic use where resistance to water and pliability are the chief requirements.

To what cellit can replace celluloid is not yet definitely ascertained. Certain technical difficulties have recently been overcome in blowing articles of the new substance. Such hollow objects as balls, dolls' heads and the like are now as easily prepared as from celluloid.

The latest application is among the most important. It is the use of cellit films for the cinematograph. Its manifest superiority over celluloid for this purpose results from its non-combustibility.

A cellit film exposed for ten minutes to the concentrated light of an arc lamp does not exhibit the slightest alteration. A celluloid film, under the same conditions, bursts into flame after the lapse of only three seconds. The cinematograph has now entered so extensively into the category of popular entertainments that a film material will be most welcome which will obviate the serious danger thus far attendant upon the employment of the current mechanism and already productive of several tragic catastrophes.

HOW TO AVOID PARCHMENTIZING

With a view to providing his colleagues with practical and inexpensive methods of avoiding the "parchmenting" of the pulp and the resulting depreciation of the paper, a correspondent of the Wochenblatt fur Papierfabrikation remarks that if we compare with our machine made papers those of Chinese manufacture composed of fine fibres, with good felting properties, we will see a marked difference. This he attributes to treatment with wooden hammers or beating sticks instead of our system of cutting with knives.

In view of this fact, our modern paper experts have uninterruptedly striven to improve matters through the use of edge runners and stone hollanders. The opinion is expressed, however, that only the former is a real advance; the latter system, specially applied to imitation parchments, being practically a retrogression.

While rags are usually less sensitive to the influence of ordinary grinding processes, the contrary is the case with cellstuff fibres. If the lifting of the rollers is even slightly delayed the "parchmenting" of the paper is to be expected.

From many years' experience in the manufacture of silk papers and Swedish Kraft papers, the writer of the communication found that the particular method of boiling the cellstuff and the treatment of the mass with the Kollergang was the most resultful plan. To the harmony between these two factors is to be attributed the fact that the real Swedish Kraft paper, instead of an ordinary cellstuff

brilliancy, has a dull appearance, resembling that obtained with rag pulp.

On a similar principle, the writer succeeded with tissue paper under 0.43 ounce per square yard in producing an opaque effect, by which the cellstuff paper could hardly be distinguished from a high class rag paper.

For the purpose of obtaining greater strength it is suggested that the brushing of the pulp for silk paper should not take place in the hollander separately, as with the pulp mill. The pulp would be treated as thoroughly as possible in the edge runner, and only for a short time in the hollander, before going into a grinding apparatus. In the latter, by the use of appliances resembling cards, or by similar machinery, the pulp would be treated like cotton at spinning mills.

The opinion is, moreover, expressed that such a process would materially increase the opacity and toughness of the paper, in consequence of better mixing and felting, both in a longitudinal and in a transverse direction, the formation of pulp meal and losses on the wire being thus much reduced. In this way the difference between the appearance of paper from rags and pulp would be lessened, and the felting of the paper would resemble the toughness of a woven fabric.

UNIFORM STRUCTURE IN PAPER.

The pulp for laid papers ought not to be beaten so "wet" as the pulp for wove papers, because "wet" beating makes hard paper, and hard papers do not take the watermark clearly. So that for laid post papers a soft-boiled wood pulp should be selected, and caution is necessary in the beating. China clay and talc should be avoided for post papers, because they destroy the "rattle," but a small addition of so-called brilliant white (pearl hardening) is permissible. Post papers with a beautifully even "look-through" can be made from a mixture of good "wet" beaten wood pulp of hard quality, with a little straw cellulose.

Excessive beating has the drawback of making the paper gray, an evil which cannot be remedied by dyeing the pulp, nor in any other way. If, in spite of suitable beating, the paper looks "wild," the error generally lies in the manipulation of the paper machine. For instance, if the pulp arrives on the wire with too much water—although a large amount of water is necessary for good structure, in order that the distribution of the fibres by the shake can take effect—eddies are liable to be formed by the rapid rush of pulp under the slices, and fibres are thus liable to clot together, and the object of the shaking to give uniform distribution will be frustrated. To get good structure the flow on the wire must be steady and uniform.

Another cause of "wild" structure in the case of post papers is an excessive length of fibre; further, also, if the paper be too dry when it reaches the dandy roll. If only a few sheets of a making of paper suffer from "wildness," the fault is almost certainly in the dandy roll; either it is running too dry, or, owing to bad mounting, is not running uniformly with the wire.

One very important means exists for improving the uniformity of the structure of the paper; that is, the Jordan or Marshall refiner, through which the pulp should be passed on its way from the beater to the stuff chest. This refiner draws out the fibres separate from one another, and lays them straight; it has a sort of "combing-out" effect on the pulp. The refiner is not suitable, however, for pulps containing high proportions of linen rag fibre, because it straightens out the fibrillæ, on which the strength of the pulp so much depends, and in a measure undoes the work which has been performed in making them. The felting capacity of the fibres is thereby reduced, and the object with which the refiner is used is defeated. Otherwise, the refiner is

strongly recommended, not only for post papers, but also for fine printing papers, wherever an improvement in the "look-through" is desired.—Papier Fabricant.

TEST FOR ANIMAL SIZE.

In a paper read before the London Section of the Society of Chemical Industry, entitled "The Chloramine Reaction of the Proteins and some Industrial Applications," some interesting results are given of researches relating to the chemistry of paper. These chemists have discovered that the proteins as a class—to which class belong albumin, casein and gelatine—possess the property of combining with chlorine to form bodies called "chloramines."

The peculiar property of these chloramines consists in the fact that they contain chlorine in the "active" state, and show many of the reactions of hypochlorites, such as ordinary bleaching powder. The chloramines are prepared by treating the protein substance with either an acid or alkaline solution of bleaching powder, or else with moist chlorine gas. The "active chlorine" thus fixed on the protein in the form of chloramine cannot be removed by exhaustive washing with water, and even if the substance be washed for days in running water it will still show a strong reaction when tested for "active chlorine" by the usual reagent; potassium iodide and starch.

In using the chloramine reaction for the detection of gelatine or casein in paper, the following procedure is recommended:—The paper is damped with cold water, either by immersion or by a flat brush; it is then placed in a bottle into which a stream of chlorine gas is led by means of a glass tube. The chlorine gas is generated by the action of muriatic acid upon permanganate or bleaching powder contained in another bottle. The chlorine is allowed to act on the paper for about half an hour, and the paper is then removed. The excess of chlorine must now be eliminated; this could be done by prolonged washing with water, but the quickest method is as follows: A basin of water containing about 2 per cent. of sodium phosphate is heated until its contents attain a temperature exactly of 45 deg. C. At this point the sample of chlorinated paper is dropped into the bath and kept there for exactly five minutes; it is then removed and is ready for testing. the test solution consists of a dilute solution of potassium iodide and a little boiled starch paste. When this is dropped on the paper an intense blue colour is developed if the paper contains animal size, either gelatine or casein, whereas engine-sized paper remains quite white. This test possesses certain advantages over the usual tannic acid test; in the first place any, even the smallest, scrap of a sample of paper may be tested with as much certainty as a large piece; next, any number of samples may be tested simultaneously, with no more expenditure of time and trouble than for one sample; and, lastly, the presence of a large proportion of starch in the paper has no effect on the delicacy of the test. Although the chlorine gas method is preferred, the paper may also be chlorinated by immersion in an acidified solution of bleaching powder for half an hour, the subsequent treatment being the same.

—At the annual convention of the National Association of News Dealers, Booksellers, and Stationers, at Philadelphia, on August 20th, a resolution was passed urging the removal of the tariff on pulp and other commodities entering into the making of white paper.

To Pulp Manufacturers.

Young Scotsman, with live connection amongst English and Scottish mills, wants to hear from Canadian Wood Pulp manufacturers who are wishing to build a business in Great Britain. Advertiser has lived some years on the Continent and in U.S.A., and speaks German. Full particulars and references when required. Address

J. M. S.,
Pulp & Paper Magazine, Toronto.

TESTS FOR TRANSPARENCY OF PAPER.

While paper testing has a number of well conceived tests for the most important properties, such as strength, elongation, thickness, composition, etc., there are still various physical and chemical properties for which, says Dr. Schmidt, suitable methods of investigation are lacking. One of these is the transparency of paper.

IMPORTANCE OF TRANSPARENCY

In various industries this property is of material importance, particularly in the manufacture of diaphanies, tracing papers, pergamyn paper, and latterly of window envelopes. The German Post Office insists on a high degree of transparency in the latter, so

one-twentieth. The light, however, is subjected to a renewed reflection each time it passes through a sheet, and the diffusion and polarization of the light have to be taken into account to arrive at exact conclusions.

TWO VALUES OF REAL IMPORTANCE.

Basing his proposals on above facts, Dr. Schmidt states that in order to test paper for its transparency two different values must be clearly distinguished: (1) The general property of the paper for allowing the passage of light: (2) the possibility of reading writing through the paper (or its "clearness").

These values have a fundamentally different meaning. A

On this subject tests were made upon a number of papers, including:

1. So called hemp and esparto papers, rendered transparent for light through saturation with paraffin.

2. An Austrian window envelope of the Myrtle Hill Company.

3. American window envelope of the Transo Paper Company.

4. A series of parchment papers of Gebruder Schmitz Duren.

5. Window envelopes of the most recent manufacture made by Reinhart Schmidt, in which the transparency of the paper is produced by means of oils which dry.

RESULTS OF TESTS

Dr. Schmidt remarks that in regard to the use of trans-

HOW TO TEST CLEARNESS OF TRANSPARENT PAPERS

While a relatively large part of Dr. Schmidt's tests deal with the optical features of the question, the results indicating "clearness" or distance from the paper at which text is legible have a practical value. This standard of clearness is higher the greater the distance is at which the text remains legible. A practicable method of applying this test is the following:

Several squares of plate glass are procured of 8-10 cm. (3.12 to 3.90 inches) lateral measure, and of graduated thicknesses from 1 mm. (0.039 inch) to 10 mm. (0.39 inch). Two Indian ink lines are then drawn, each of 1 mm. (0.039 inch) in thickness and the same distance apart from each other. These

In tracing paper and tracing linen a lower degree of clearness is sufficient, the paper being usually stretched over the drawing to be reproduced.

In conclusion Dr. Schmidt remarks: "If the definition of the degree of clearness which I propose cannot claim to furnish very exact results, it has the advantage of simplicity, as it can be undertaken by anyone in the paper trade with the help of limited appliances. Its use in combination with the other methods named affords such a clear idea of the qualities of transparent papers that I urge the general adoption of these tests."

it is no longer possible to distinguish the two lines and when they run into each other. The distance thus expressed forms a practicable standard for the clearness of the material.

In Dr.Schmidt's opinion good window envelopes, as generally used, should be so made that the lines only become confused at the distance of 10.13 mm. (0.39 to 0.51 inch), in which case addresses (even typewritten) are fairly legible at a distance of 3-5 mm. (0.12-0.20 inch) from the paper. Envelopes without this degree of transparency are regarded as unsuitable by the German Post Office, as in such cases the officials have to flatten the letters out in order to find the address. The samples of most recent date are said to combine clearness with substance, being in that respect superior to crystal pergamyn papers.

the test and again when thrown back through the paper to reach the eye of the reader. A twice repeated loss has thus to be taken into account, the practical (for reading) transparency of the paper samples.

Paraffin is shown to be an unsuitable ingredient for paper requiring much transparency. Pergamyn papers are in some cases very transparent, but are mostly very thin and light in weight. The much heavier papers of window envelopes tested show a degree of reading transparency represented by 48.5 per cent., while in the least transparent papers only 4 to 5 per cent. of the light is thrown back.

little transparent to light, but writing can be read through it, as it possesses in a high degree the "clearness" referred to by Dr. Schmidt.

TESTS FOR CLEARNESS

In a detailed consideration of the question of transparency Dr. Schmidt draws practical conclusions from optical tests as to the strength of the light of lamps, which are of less interest to paper manufacturers than the points referring to the second value - that of clearness in connection with the raw materials used.

In cases of dispute as to [illegible] arbitrators (in the absence of a better method) have been accustomed to place so many sheets above each other, and by comparing the number of sheets thus placed until it was impossible to read through them, some idea of their relative transparency could be obtained. This was, however, an imperfect process, not serving as a guide to manufacturers for the proper mixing of the pulp or for the right working of the paper on the machine.

The tests made with the "diaphanometer" of Dr.Klemm, constructed by Louis Schopper, of Leipzig, represent the number of sheets of paper required to hide the light of an amyl-acetate lamp. Thus if twenty such sheets are required the "transparency value" would be

TESTS FOR TRANSPARENCY OF PAPER.

While paper testing has a number of well conceived tests for the most important properties, such as strength, elongation, thickness, composition, etc., there are still various physical and chemical properties for which, says Dr. Schmidt, suitable methods of investigation are lacking. One of these is the transparency of paper.

Importance of Transparency.

In various industries this property is of material importance, particularly in the manufacture of diaphanies, tracing papers, pergamyn paper, and latterly of window envelopes. The German Post Office insists on a high degree of transparency in the latter, so as to prevent delays in sorting the letters.

How Tests Have Been Made.

In cases of dispute as to the quality of transparent papers arbitrators (in the absence of a better method) have been accustomed to place so many sheets above each other, and by comparing the number of sheets thus placed until it was impossible to read through them, some idea of their relative transparency could be obtained. This was, however, an imperfect process, not serving as a guide to manufacturers for the proper mixing of the pulp or for the right working of the paper on the machine.

The tests made with the "diaphanometer" of Dr. Klemm, constructed by Louis Schopper, of Leipzig, represent the number of sheets of paper required to hide the light of an amyl-acetate lamp. Thus if twenty such sheets are required the "transparency value" would be one-twentieth. The light, however, is subjected to a renewed reflection each time it passes through a sheet, and the diffusion and polarization of the light have to be taken into account to arrive at exact conclusions.

Two Values of Real Importance.

Basing his proposals on above facts, Dr. Schmidt states that in order to test paper for its transparency two different values must be clearly distinguished: (1) The general property of the paper for allowing the passage of light: (2) the possibility of reading writing through the paper (or its "clearness").

These values have a fundamentally different meaning. A ground or corrugated pane of glass is very transparent, so far as light is concerned, but cannot be read through. A colored but polished pane of plate glass is sometimes but little transparent to light, but writing can be read through it, as it possesses in a high degree the "clearness" referred to by Dr. Schmidt.

Tests for Clearness.

In a detailed consideration of the question of transparency Dr. Schmidt draws practical conclusions from optical tests as to the strength of the light of lamps, which are of less interest to paper manufacturers than the points referring to the second value—that of clearness in connection with the raw materials used.

On this subject tests were made upon a number of papers, including:

1. So called hemp and esparto papers, rendered transparent for light through saturation with paraffin.

2. An Austrian window envelope of the Myrtle Mill Company.

3. American window envelope of the Transo Paper Company.

4. A series of parchment papers of Gebruder Schmitz Duren.

5. Window envelopes of the most recent manufacture made by Reinhart Schmidt, in which the transparency of the paper is produced by means of oils which dry.

Results of Tests.

Dr. Schmidt remarks that in regard to the use of transparent paper for tracing, for window envelopes, etc., the percentages shown are not quite exact, as in reading the light must pass through the paper twice, once for it to arrive at the test and again when thrown back

through the paper to reach the eye of the reader. A twice repeated loss has thus to be taken into account, the practical (or reading) transparency of the paper samples.

Paraffin is shown to be an unsuitable ingredient for paper requiring much transparency. Pergamyn papers are in some cases very transparent, but are mostly very thin and light in weight. The much heavier papers of window envelopes tested show a degree of reading transparency represented by 48.5 per cent., while in the least transparent papers only 4 to 5 per cent. of the light is thrown back.

How to Test Clearness of Transparent Papers.

While a relatively large part of Dr. Schmidt's tests deal with the optical features of the question, the results indicating "clearness" or distance from the paper at which text is legible have a practical value. This standard of clearness is higher the greater the distance is at which the text remains legible. A practicable method of applying this test is the following:

Several squares of plate glass are procured of 8-10 cm. (3.12 to 3.90 inches) lateral measure, and of graduated thicknesses from 1 mm. (0.039 inch) to 10 mm. (0.39 inch). Two Indian ink lines are then drawn, each of 1 mm. (0.039 inch) in thickness and the same distance apart from each other. These lines are then looked at through the pergamyn or oil papers to be tested, pieces of glass of different thicknesses being placed between them. A distance is then at last found at which it is no longer possible to distinguish the two lines and when they run into each other. The distance thus expressed forms a practicable standard for the clearness of the material.

In Dr. Schmidt's opinion good window envelopes, as generally used, should be so made that the lines only become confused at the distance of 10-13 mm. (0.39 to 0.51 inch), in which case addresses (even typewritten) are fairly legible at a distance of 3-5 mm. (0.12-0.20 inch) from the paper. Envelopes without this degree of transparency are regarded as unsuitable by the German Post Office, as in such cases the officials have to flatten the letters out in order to find the address. The samples of most recent date are said to combine clearness with substance, being in that respect superior to crystal pergamyn papers. In tracing paper and tracing linen a lower degree of clearness is sufficient, the paper being usually stretched tightly over the drawing to be reproduced.

In conclusion Dr. Schmidt remarks: "If the definition of the degree of clearness which I propose cannot claim to furnish very exact results, it has the advantage of simplicity, as it can be undertaken by anyone in the paper trade with the help of limited appliances. Its use in combination with the other methods named affords such a clear idea of the qualities of transparent papers that I urge the general adoption of these tests."

LITHOGRAPHIC PAPERS.

Among the requirements of uncoated lithographic printing papers, the first point is the uniform structure in the look-through and of the surface of the paper; cloudiness or wildness is very bad for printing. The composition of the stuff must be selected so that the separation of the sheets after printing can take place easily. The papermaker can readily tell whether his paper is hard or soft. Hard papers are a great source of trouble in printing, owing to "setting off," since the paper fibres, if closely felted and pressed together do not absorb the printing ink, and the sheets stick either to the waste paper placed between them, or worse still to the backs of other sheets. The sensitiveness of uncoated papers to moisture has always to be considered. Laying out in small packs before dispatch helps to season the paper

and to bring it into proper condition. In obstinate cases an extra rolling of the paper between metal and plates gives a flat sheet. The pressure of the calenders must be suited to the thickness of the paper, since too heavy glazing closes up the pores of the paper and causes "setting off." Uncoated papers are far more liable to expansion than coated papers since the latter generally receive a preliminary impression of protective substance before printing. Uncoated papers are run over the stone before printing, but nothing is put on them. Sometimes the sheets are passed through a calender in the cross-direction of the web to prevent unequal expansion; this ought to be done in the paper mill. An equally hard sizing in all parts of the paper is an essential in order to ensure an equal pulling off of the color, the finish of the paper must also be equal in all parts of the sheet. A bad lot of lithographic paper can be worked up as middles for cardboard of good quality, but with some loss. Frequently the paper is required to stand writing after printing and must be sized accordingly. The requirements of a good litho paper are rather high, but the prices are good. Color and freedom from defects are of considerable importance; the presence of iron in the papermaking water may give a delicate white paper a tinge of yellow. This may not be noticed until the paper is printed, when the necessary harmony of light and shade, depending on the contrast between the printing colors and the paper ground may be spoilt. If the printer would inform the papermaker of the exact use to which the paper is to be put after printing many troubles might be avoided. Lastly, the papermaker cannot be too careful to supply a good waterproof packing. Boxes should not have holes or splits in them, and if the box gets wet the paper inside may easily be spoilt if it be not unpacked immediately. If this happens, the printer will do well to lay out the paper between sheets of moist waste paper, and possibly a subsequent rolling may be necessary. The cut edges of the paper are extremely sensitive to a cold atmosphere and the moisture which it deposits in the paper.

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A light paper having the properties above can, it is said, be prepared by a process patented by M. Fernand Poirier. It is claimed that the paper so prepared is as strong as parchment, and far more supple. It can be grained, dyed, or goffered, and often forms a convenient substitute for leather or indiarubber. It is made with fibres of bamboo and eucalyptus, mixed with the bark of various shrubs, such as midzumatu, kozo-kodzon, gampi, etc. The raw material is torn up, dried, cleaned, devilled, scoured, and rinsed. It is then beaten up with an adhesive decoction made from certain roots and also containing camphor, oil of turpentine, indiarubber and rosin. The paste is moulded as in the usual hand-process. Finally, to give finish or satinising, as well as its special qualities of strength and impermeability, the paper is calendered between rollers heated to the proper point for absorbing the moisture and giving the necessary cohesion to the web. There is no difficulty in sizing the paper during the manufacturing process.

The resulting paper is very light, although as strong as parchment. It can be crumpled up and then washed with potash or any soap without tearing. It has the curious property, although it is impermeable, of absorbing perspiration. Hence it is eminently hygienic, and can be advantageously employed to replace indiarubber in the manufacture of waterproof garments. It acts as a protective against the weather, and can be used for such purposes either alone, or as a lining for ordinary fabrics, or as an insertion between them and the usual lining In either case it makes the garments

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THE MARKETS.

Toronto, Sept. 12th, 1908.

While all dealers do not state the same thing, it is a very general belief in the paper trade that business is steadily improving, though more slowly than seemed probable in the earlier part of the summer. As soon as the regular crop movement begins in earnest there is sure to be an enhanced movement of revival, though the crops on the whole are scarcely likely to be so phenomenally good in quantity and quality as seemed likely two or three months ago. The fact that the general elections are to be held within the next two months is also likely to have a slight retarding effect on the progress towards full recovery. Pulp is dull and in slow demand, both from Great Britain and the United States. The prevailing price for ground wood delivered at mill in United States is around $23. Sulphite brings near $40.

British.—The market for ground wood is very dull, though prices seem to continue firm. Buyers are holding off. Ordinary grades of sulphite and soda pulps have gone down in price. The attitude of some sellers, says World's Paper Trade Review, is certainly not in the best interests of the market.

The market for chemicals is steady Ammonia alkali, 58 per cent., is quoted at £4 15s. f.o.b. Liverpool; bleaching powder, soft wood, £4 12s. 6d. f.o.r. Lancashire; caustic soda, 76-77 per cent., £11; soda crystals, £2 17s. 6d. Tyne; salt cake, £2 2s. 6d. f.o.r. Lancashire; recovered sulphur, £5 to £5 5s.; alum and sulphate of alumina, unchanged.

Swedish Market for Pulp.—Cellulose is, it appears, temporarily rather depressed, because Swedish makers attempt to force their unsold balances on an indifferent market. Financial necessities may partially explain this impatience on the part of sellers, and the Swedish mills have also a greater increased output of medium and lower grades to dispose of, so one has to be prepared for a certain amount of nervousness on their part.—"Farmand."

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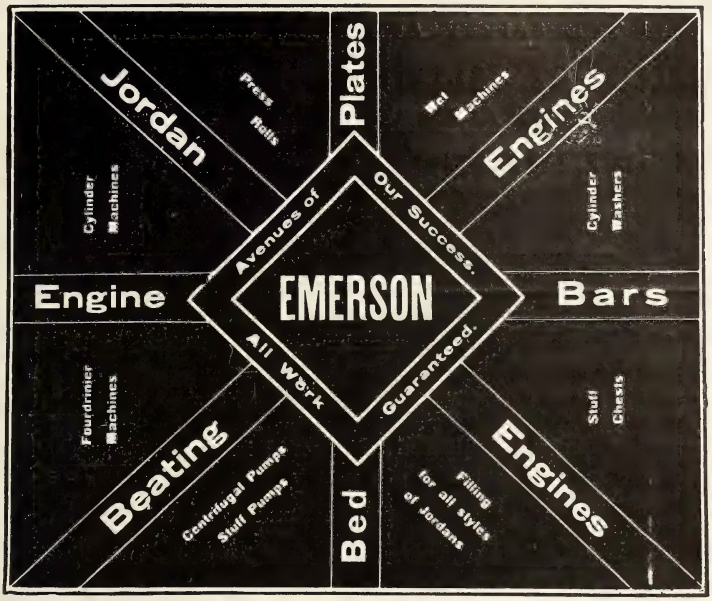

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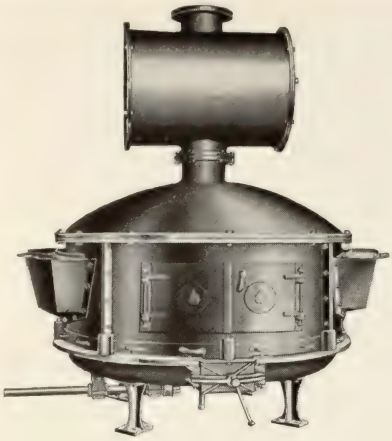

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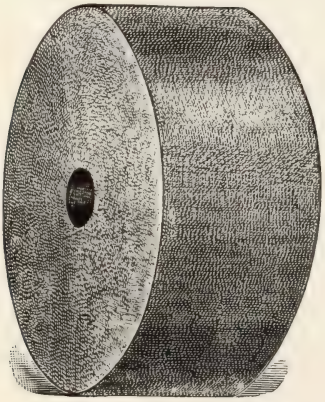

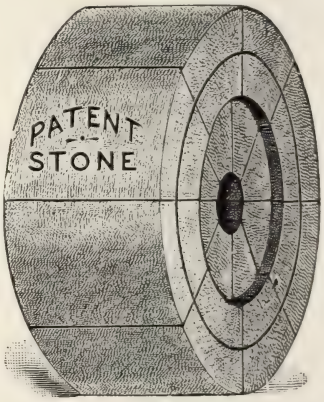

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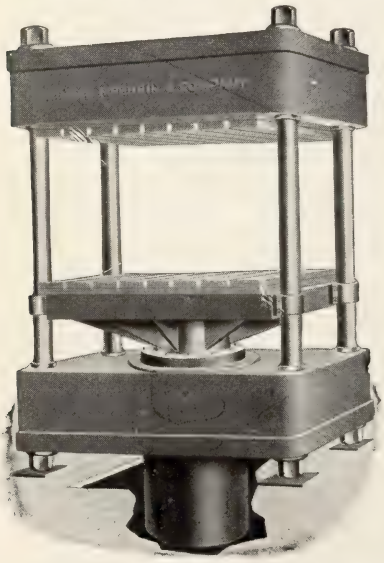

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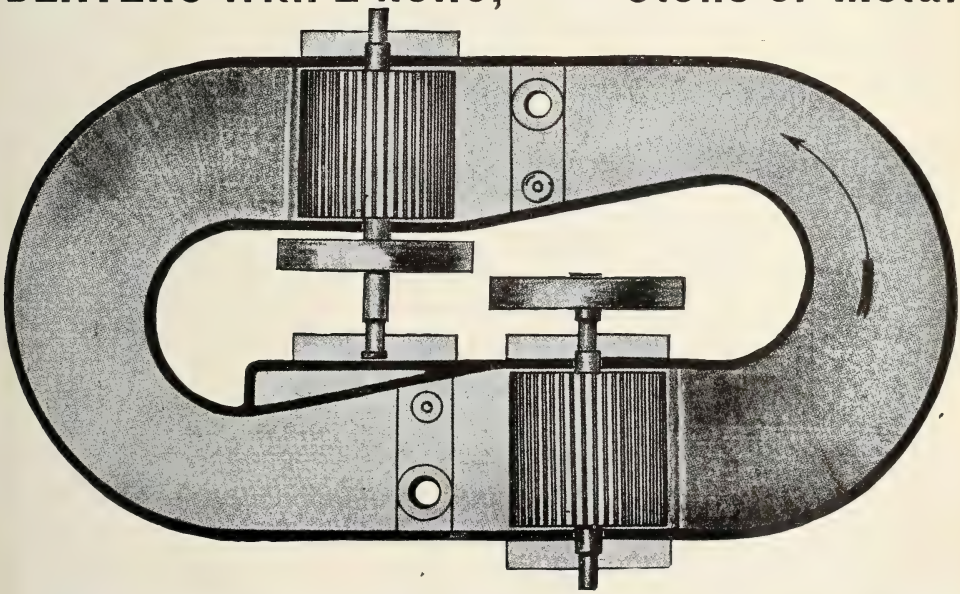

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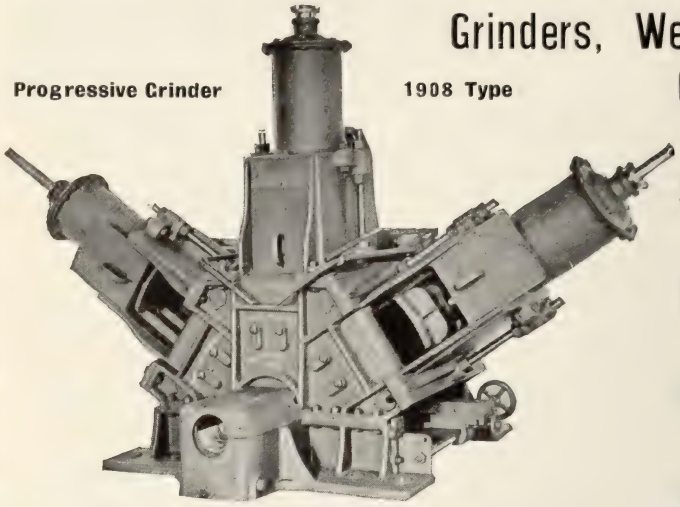

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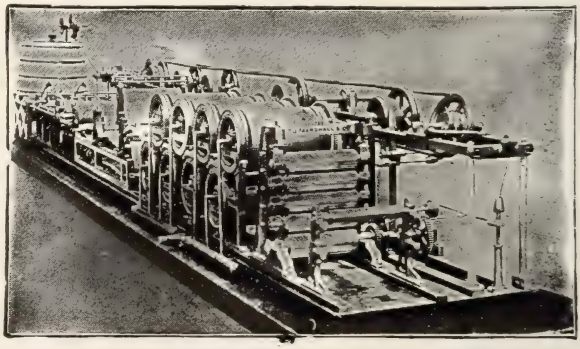

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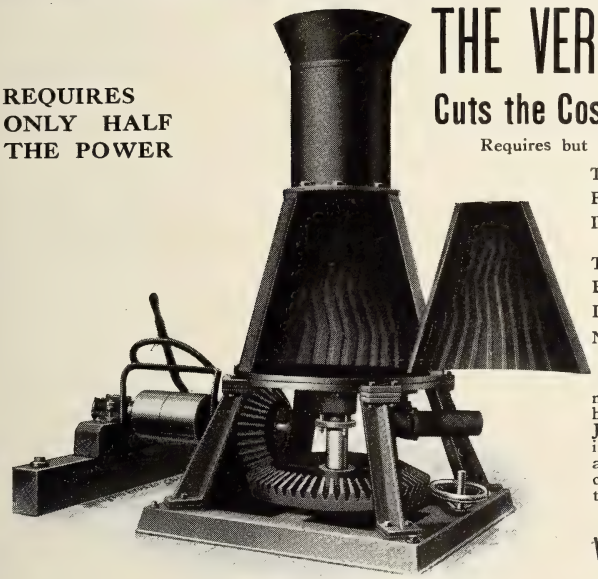

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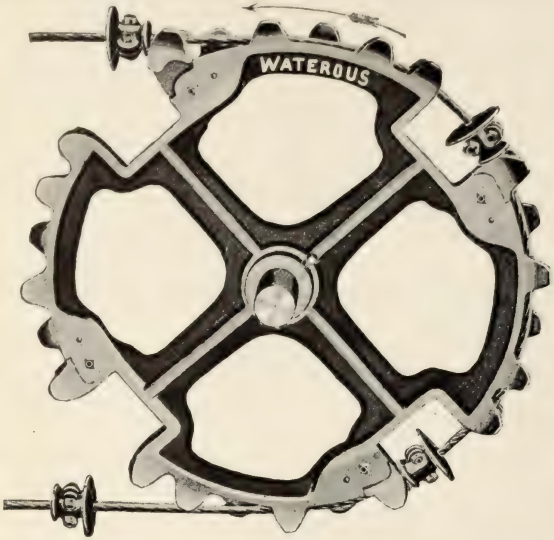

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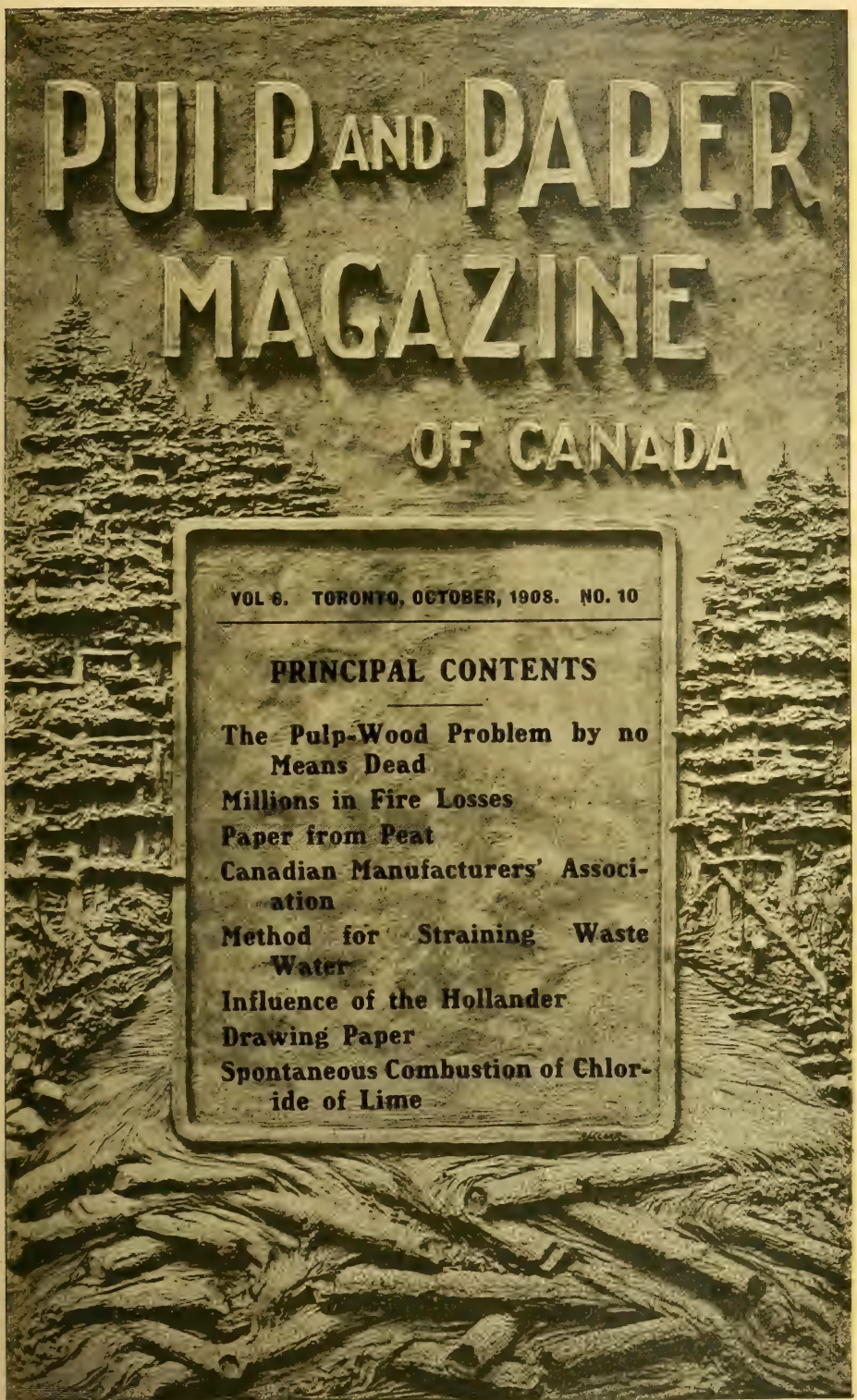

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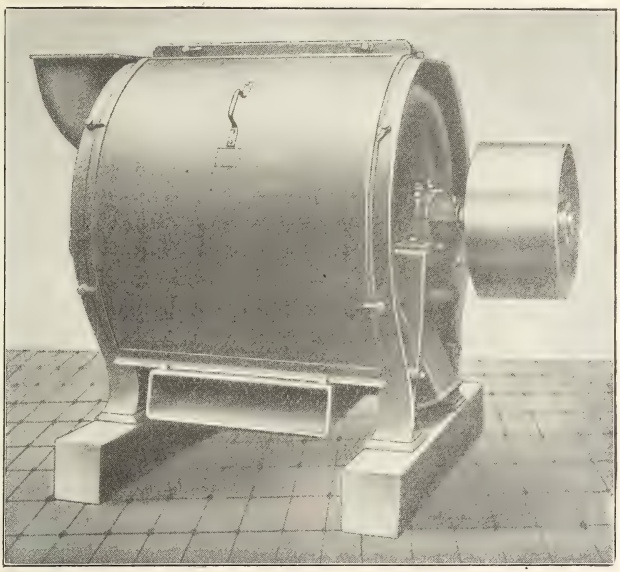

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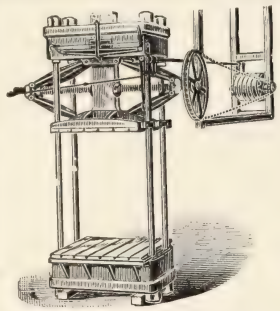

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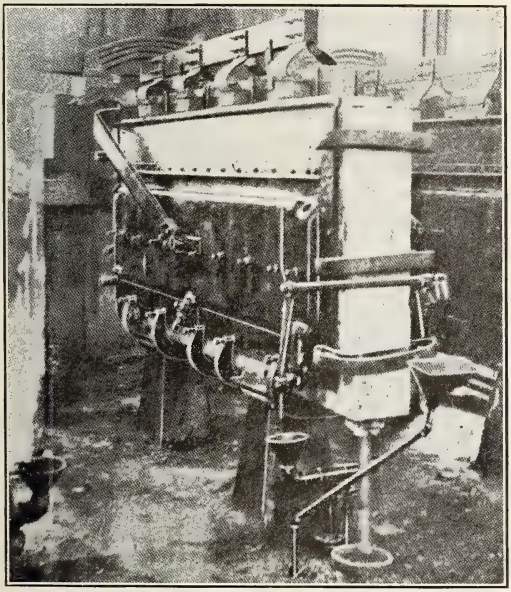

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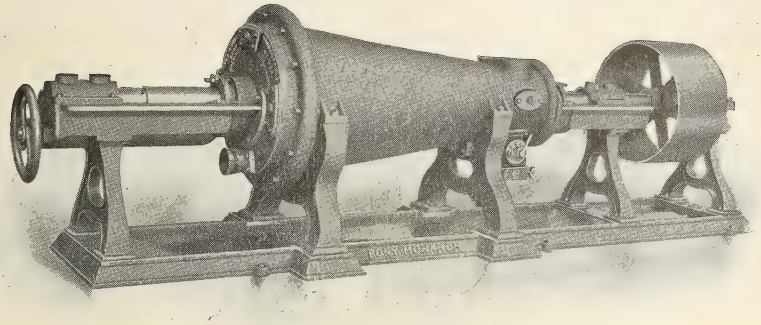

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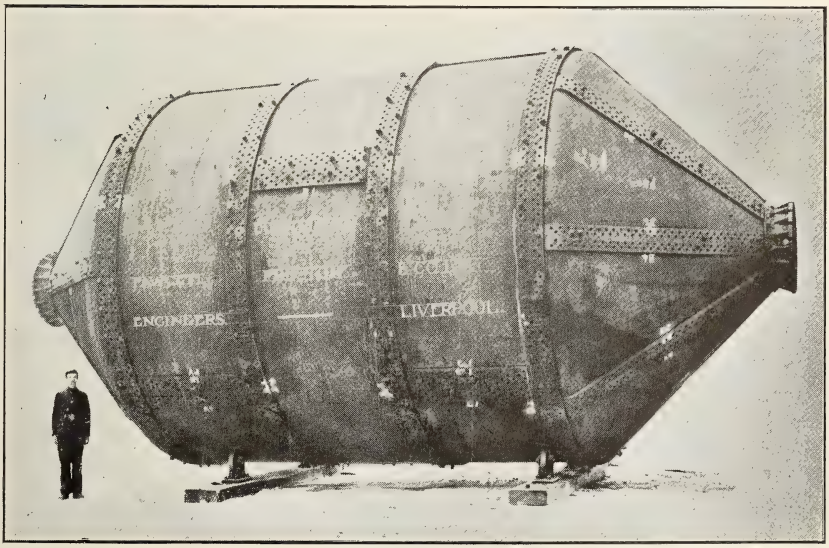

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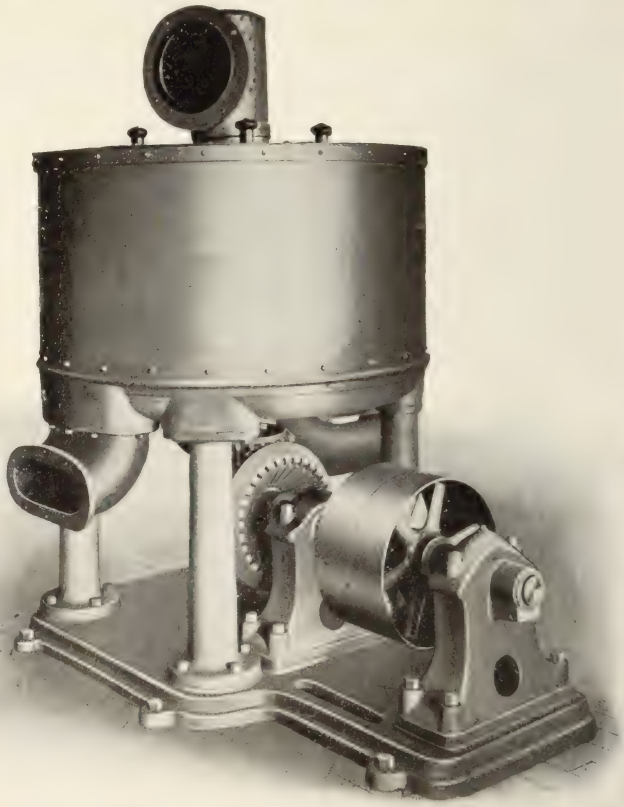

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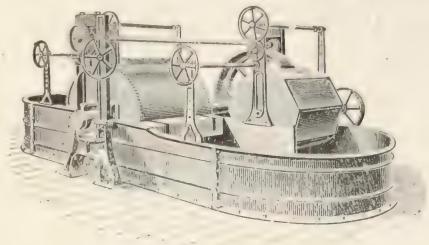

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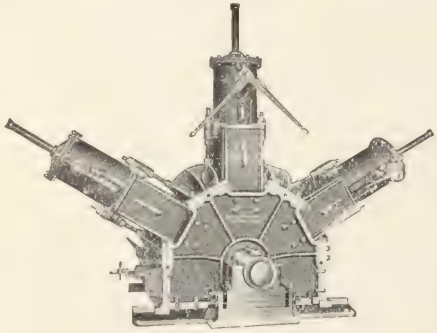

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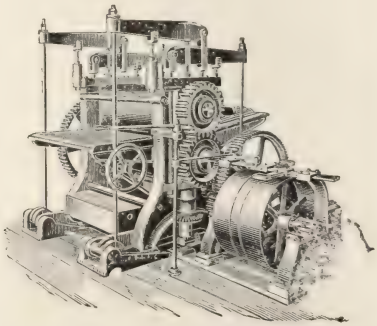

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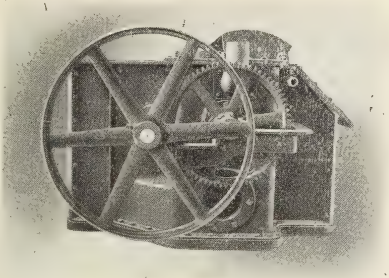

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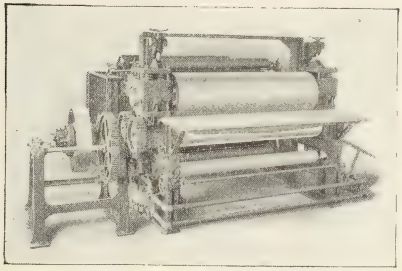

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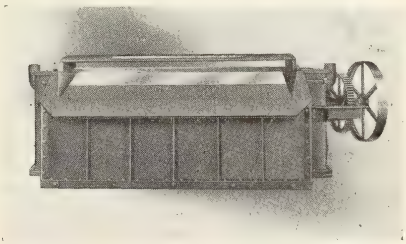

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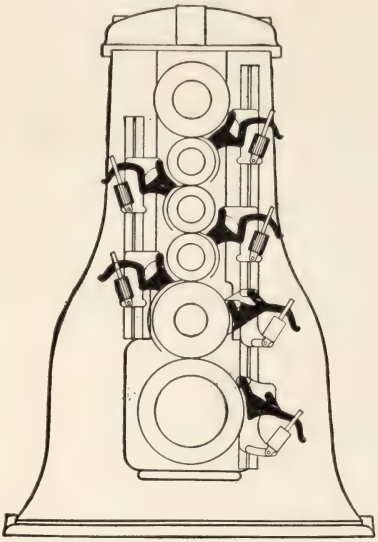

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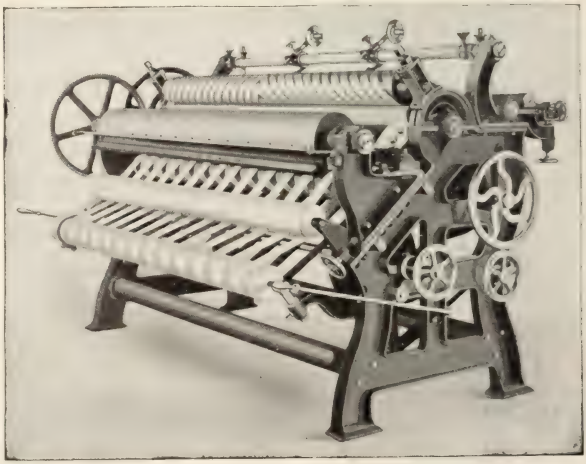

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Steam Log Hauler, owned by J.M. Craig, Sherbrooke
Operated by him in Megantic District
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Weight of load 200 000 lbs
" " Sleds etc. 55 000
Hauled 10 miles from loading point

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¶ It is not confined however to such roads as it will work with profitable results on any road that horses can.

¶ It will not get blocked by every snow storm either as it can wade through as much as 18 inches of snow with 50 per cent. of its usual load.

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¶ It will haul from 75,000 to 100,000 ft. on average roads, but on a good level road one Western operator has actually hauled 180,000 ft. at a single load.

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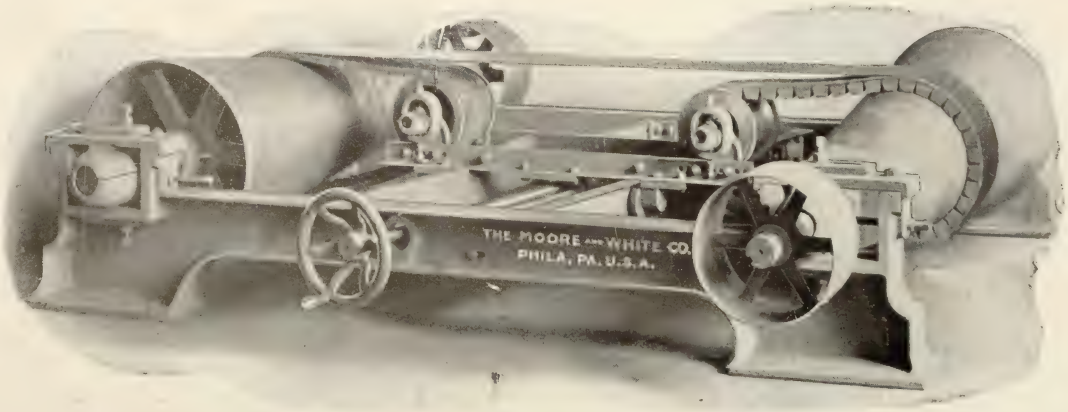

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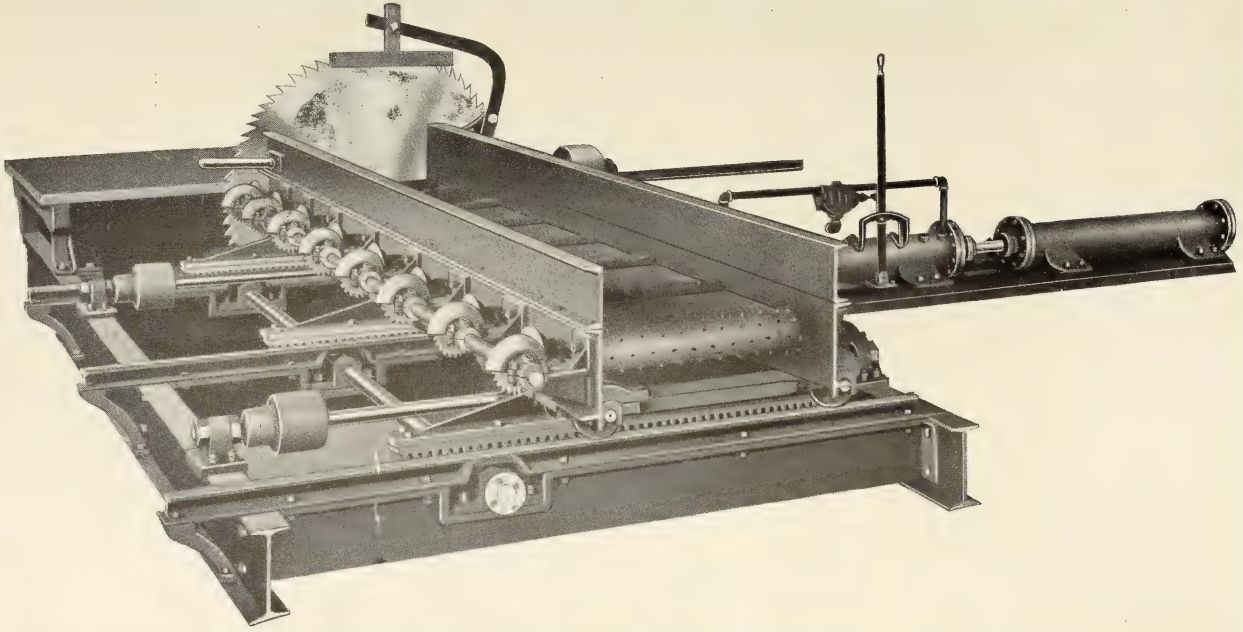

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THE PULP AND PAPER MAGAZINE OF CANADA

Vol. 6.—No. 10. TORONTO, OCTOBER, 1908. $1 A YEAR / SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

SUBSCRIPTIONS: Canada and British Empire, $1.00 per year; United States and Foreign, on account of postage $1.50 per year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month, and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

BIGGAR-WILSON, Ltd.,
PUBLISHERS
OFFICES, CONFEDERATION LIFE BUILDING,
TORONTO, CANADA.

THE PULP-WOOD PROBLEM BY NO MEANS DEAD.

A correspondent of one of the American paper journals, in the attempt no doubt to bolster up the declining hopes of his readers, and perhaps deluded by the wish which is the father to the thought, writes that the Dominion election campaign is being carried on without much reference being made to the question of an export duty on pulp-wood. He states that Government supporters appear to be satisfied with the assurances given near the close of last session, that the whole question would be enquired into by a commission. This is true, and therefore if the Government be returned to power there is no reason to doubt that with the overwhelming evidence which can be produced before a commission in favor of restricting the exportation, that would be the outcome of such an enquiry. But, supposing the Government to be defeated, there is no reason to suppose that our friends across the border would be any better off, so far as easy access to Canadian pulp-wood is concerned. Prominent members of the present opposition are known to be absolutely in favor of prohibiting the export of Canadian pulp-wood, and one of the first steps of a new Government would be to so arrange matters. Such a step would not show in the slightest any feeling of enmity towards the United States, but merely what our neighbors consider the first duty of any nation, viz., the preservation of its own interests. The aforesaid correspondent, in his desire to quelch any idea of the possibility of Canada conserving its own resources, goes a step or two beyond the confines of strict accuracy. He says:—

"Within the last few years many pulp and paper manufacturers of Quebec have gone into business of exporting pulp-wood, and have shipped thousands of cords to the United States. They found it paying better to ship the pulp-wood than to make it into pulp. One of these manufacturers states that when he could not get $12 per ton for pulp the wood was selling for $6 and $8 per cord f.o.b.

upon the cars. At that time a great many paper mills found it better to ship the wood."

We do not remember a time when pulp could be obtained for less than $12 per ton. Nor do we remember a time that pulp sold even cheaply when wood was worth $8 f.o.b. cars. This appears therefore to be a double-jointed exaggeration. It is true that there are certain interests in the Province of Quebec who object to any restriction upon Canada's exportation of pulp-wood; but there are few who doubt that with further education and with the logic of object lessons before them, that the fears of Quebec in general will finally, and soon, be overcome.

One can gain a pretty clear idea of how this matter is looked at among our neighbors by reading the evidence recently delivered before the Washington Congressional Committee of investigation. One of the witnesses, N. M. Jones, manager of a large pulp and paper mill in Maine, said:—

"Unless we can get our material as cheaply as the Canadian mills do, we will have to quit business, for we cannot compete with them."

Asked if, in his opinion, the pulp-wood supply is ample in this country for an almost indefinite period, Mr. Jones replied that in Maine the supply is perhaps practicably inexhaustible, but in the Middle West, especially in Wisconsin, Michigan and Minnesota, where most of the paper mills are located, the manufacturers will soon be obliged to procure their pulp-wood from Canada. "The only thing I see to do," said Mr. Jones, "is to make a treaty with Canada; not as a tariff, not as a Republican party to-day and a Democratic party to-morrow, but a treaty whereby the tariff on wood pulp would be cut off if our mills were allowed to purchase pulp-wood in Canada at the same figures that Canadian mills do; but I would also increase the duty on European pulp 100 per cent. Europe is our greatest competitor, not Canada. The market of the United States and Canada is large enough to use all the wood-pulp sulphite and paper manufactured in this country and Canada, if a treaty were made, and the duty on European goods increased."

It may be pointed out that the proposed policy of restriction is by no means so "un-British" as some have claimed it to be. The new British patent law which compels all patented processes and articles to be operated and produced within the United Kingdom under penalty of forfeiture of patent rights is really legislation along exactly similar lines. One law protects British industries, the other would protect Canadian national assets.

MILLIONS IN FIRE LOSSES.

Forest fires in every part of Canada during the past two months, fires in which the actual loss of timber may be set down at anything between $25,000,000 and $50,000,000 besides the probably much greater loss of soil fertility and besides the incalculable effects of the ruin of the trees upon climate and water-powers, force upon the attention in an absolutely inescapable way the fact that something must be done by our Governments to prevent this terrible evil. **Something** of course is done now, in the way of fire rangers and other means of protection. But, if necessary, we must increase ten times over the amount of money now spent in such means of pro-

tection. It is simply impossible to sit still and see the country's future, agricultural and industrial, thus go up in smoke. If a tithe of the reports be true, but a small proportion of the sums annually appropriated by our Governments for improper, or at least doubtful purposes, would go a long way towards a tangible means of protection of the people's forest wealth. A way must be found.

PAPER FROM PEAT.

A United States firm writes:—We should like to secure all information possible on the subject of the manufacture of paper from peat. Hitherto, we know of no paper that has been made out of peat alone, and are under the impression that so-called peat papers are made from a large percentage of a fine grade of sulphite pulp.

We should like to know how the Pulp and Paper Trade of Canada regard this industry, and whether there has been any success in the manufacture of straw board from peat alone. Also whether expert opinion feels that there is any future for peat, without the assistance of other kinds of strong fibred pulps.

Can you tell us about any mills in Canada or abroad that are interested in this manufacture; whether they are making a success of it and can you refer us to any reliable articles on the subject in book or magazine form?

Paper was made from peat in Ireland as far back as 1835 and in France by J. Lallemand, of Besancon, in 1854. Karl A. Zschorner, a German, also made paper from peat. The earlier processes consisted in softening the peat in cold water and agitating it to separate the fibres from earthy particles; then digesting the fibres in a solution of caustic soda of not more than 250 grains to a gallon of water. After squeezing out this liquid the fibre was soaked in sulphuric acid solution, 600 grains to a gallon of water, and then digested in a solution of chloride of lime such as used for bleaching rags. Zschorner's process started with treatment of the peat fibres in a solution of alkali, starting not higher than 2 per cent. Beaumé and decreasing by the addition of cold water. This was performed under pressure at a temperature of 4 to 25° Cent. The fibre was then treated by a solution of calcium or sodium hypochlorite of strength under 2 per cent. Beaumé at normal temperature and under higher pressure. The fibre was again put in a solution of 1 per cent. alkali under still higher pressure but normal temperature. After washing, the fibre was ready to be mixed with other pulp for the paper machine. The callender method used in Ireland in quite recent years consisted in drying the peat in the sun and artificially sorting out the roots of plants or other foreign matter and putting it through a beating engine to tease and draw out the fibres, which are then sent to the paper machine and used either alone or mixed with other paper stuff. In this process the peat was also digested sometimes in an alkali solution under steam pressure of 40 lbs., the fibre being washed after digestion. These processes are referred to in "Peat and its use and Manufacture," by Bjorling and Gissing.

The callender process as carried out in Ireland does not appear to have been commercially successful, judging by the fact that it has not extended.

In Canada the only experiments made have been under the Esser process, brought out in Australia some years ago

and patented in various countries. By this process the peat is taken wet from the bog and put into a beating machine where the earthy matter is washed away and sticks and roots taken out, and it is then sent to the beater in the mill. Samples of this were made at Glen Miller, by Miller Bros. & Co., from peat treated by A. Dobson, of Beaverton, Ont., from peat bogs of that vicinity. This paper was made for box boards, and it may here be observed that, while paper can be made from peat alone, it is not strong enough for any use except perhaps for sheathing paper or other builder's paper. The samples made in Canada—which can be seen at the office of the Pulp and Paper Magazine—are made with a mixture of about 35 per cent. of mixed paper pulp (old paper stock). There are extensive peat bogs suitable for this purpose in Canada, and there would appear to be a good field for making board papers from this material, based on the following considerations: It would cost from 60 to 75 cents per ton to haul peat to a convenient point for the preliminary treatment. The present cost of mixed paper stock is say $10.50 a ton in the United States or $10 a ton in Canada. Eleven tons of mixed paper stock will make 10 tons of paper. Now if 60 or 65 per cent. of such board paper can be made of peat the actual cost of which will be scarcely more than the cost of hauling, there would be a net saving of between $50 and $60 on a ten ton lot. Sulphite fibre would be rather too dear to use in any great percentage for such stock.

The Esser process has also been carried out in the United States at Capac, Mich., by the Pilgrim Paper Company, afterwards the American Peat Paper Company, which has turned out considerable quantities of box board from peat. These works are now closed down, but we understand their closing is due not to the failure of the process but to the over capitalization of the company and contests among the shareholders for control. It is now in process of a second reorganization. One mistake made by this company was in locating its plant where the water supply had to be pumped from a well.

CANADIAN MANUFACTURERS' ASSOCIATION.

At the annual Convention of the Canadian Manufacturers' Association, held in Montreal from the 14th to 18th of last month, the problem of conserving Canada's pulp-wood came in for a large share of attention. Hon. J. D. Rolland, in his presidential address contended that Canada had never really and properly taken stock of her timber interests. He estimated that Canada had 535,000,000 acres of forests. Estimating the amount at 2,000 feet to the acre, there was enough timber in the country to keep the Canadian mills going for 381 years. From a surface investigation one might safely say that there was no special need for Canada to conserve its forest area; but the growing demands of the United States paper mills and lumber yards shows there is a great need for us to husband our resources. He estimated that the United States would finish their forest areas in thirty-three years, and if allowed to come in and use our forests as they wished they would exhaust them in less than twenty years. Referring to the damage caused by forest fires, he urged the members of the association to make representations to the Government for a more efficient and thorough system of guarding the forests from loss by fire, and advo-

cated the employment of large numbers of fire rangers. By the destruction of forests, the rainfall was affected, the streams either becoming raging torrents or dried up river beds. We were trustees for posterity, and were not doing our duty toward future generations in allowing the wholesale destruction of our timber areas. He advocated the entire prohibition of the export of pulp-wood, and claimed that it should be manufactured here, pointing out that all Canada gets for a cord of wood exported, including freight charges, was from $6.70 to $8.50 a cord. If manufactured into paper we receive from $37 to $40 in addition to providing employment for thousands of men. If the United States were compelled to build mills here or buy their paper from Canada it would represent over $500,000,000 additional capital to this country. The pursuit of our present policy was like selling our birthright for a mess of pottage, and he declared that it was time to call a halt. Every stick of pulp-wood allowed to leave the country becomes a weapon in the hands of Canada's keenest commercial rival.

In connection with the pulp and paper section, which held a simultaneous session, the following resolution was presented and passed by the association:—"The pulp and paper section of the Canadian Mfrs. Association beg to report that at the various meetings of this section held since last autumn the members have been unanimous in the opinion that the Government of Canada be requested to preserve the forests and conserve the pulp-wood of this country by prohibiting the exportation from Canada of pulp-wood, and they ask the earnest assistance of the association in their behalf."

The committee of the pulp and paper section for the ensuing year is composed as follows: Hon. J. D. Rolland, Wm. Price, W. H. Rowley, Geo. Cahoon, Albert MacLaren, Fred. Booth and Wm. Hanson. Mr. Riordon declined re-election as chairman, and the commitee was left to nominate its own chairman at a subsequent meeting.

The following officers of the Association for 1908-9 were elected:—President, R. Hobson, Hamilton; first vice-president, John Hendry, Vancouver; Ontario vice-president, Colonel W. M. Gartshore, London; Quebec vice-president, W. H. Rowley, Hull; Nova Scotia vice-president, William Lewis, Halifax; New Brunswick vice-president, Charles Macdonald, St. John; Alberta and Saskatchewan vice-president, P. Burns, Calgary; British Columbia vice-president P. Hendry; Prince Edward Island vice-president, Hon. F. L. Haszard, Charlottetown; treasurer, George Booth. As the result of the balloting the following are the Toronto representatives on the Executive Council:—L. L. Anthes, G. Frank Beer, S. B. Brush, P. H. Burton, R. J. Copeland, L. V. Dusseau, Thomas Findley, John Firstbrook, Ed. J. Freyseng, W. P. Gundy, Samuel Harris, J. H. Housser, Alfred Jephcott, Walter Laidlaw, C. B. Lowndes, J. B. MacLean, D. H. MacKay, J. S. McKinnon, T. L. Moffat, J. H. Murray, W. C. Phillips, Thomas Roden, A. S. Rogers, T. A. Russell, A. W. Thomas, J. O. Thorn, W. B. Tindall, George W. Watts, S. M. Wickett, F. J. Campbell, J. M. Jencks, and A. G. Lomas.

—The paper manufacturers have followed Mr. Norris' example to the extent of holding public auction sales for news paper. The St. Regis Paper Company, Watertown, N.Y., was one such. They held a sale on the 3rd inst., which was well attended, and at which the prices offered showed a distinct rising tendency.

—During the last month several of the International Paper Company's mills, which were closed down owing to strikes and lockouts, reopened one by one. And now a working agreement has been arrived at between the company and the men, whereby the latter will all return to work at the proposed 5 per cent. reduction in wages.

PULP AND PAPER NEWS

American capitalists are said to be looking over the Island of Anticosti and other pulpwood areas in the vicinity of the north shore.

* * *

The North Shore Power, Pulp, Railway & Navigation Company's first cargo of pulp from its mills at Clarke City on Seven Islands has been shipped to Europe.

* * *

The Vancouver Fibre Company, Limited, Vancouver, B.C., capitalized at $600,000, has been granted a charter authorizing it to manufacture and deal in wood pulp and paper.

* * *

The Northern Island Pulp-Wood Company, Port Arthur, Ont., expects to take out 15,000 cords of pulp-wood this season, with two large camps on Simpson and St. Ignace Islands.

* * *

The Westward Ho Publishing Company, Limited, has been granted a charter to take over, with a capital of $50,000 the business now carried on in Vancouver under a similar name.

* * * *

The Booksellers and Stationers' Association of Ontario, whose name in future will be the Canadian Book, Stationery & Publishing Trade Association, held their annual meeting in Toronto last month.

* * *

In the Labor Day procession the papermakers of Ottawa and Hull made a very creditable showing, no less than 1,500 union men taking part. They won 84 out of 100 points for a good display and were awarded a medal.

* * *

The Dalmas Pulp Company, Quebec City, has been incorporated with an authorized capital of $140,000 to do a general pulp-wood business in the Peribonca River district. F. X. Drolet and A. Robitaille, of Quebec City, are charter members.

The good quality of the pulp-wood cut in Temiskaming district has been demonstrated in some samples of pulp recently produced from the same by the Hammermill Pulp Company, Erie, Pa. The color is said to be very good and the texture all that could be desired.

* * *

The American Hardpaperware Company, Limited, Toronto, capital $300,000, has been granted a charter to acquire the patents of Oswald Schmidt, manufacturer and dealer in paper, box board, paper boxes, pails, bags, envelopes, etc. C. W. Mitchell, 28 Follis Avenue, is interested.

* * *

The Thompson & Norris Company of Canada, Ltd., Niagara Falls, Ont., has been incorporated with a capital of $100,000 to manufacture and deal in paper and pulp, do a printing and publishing business, etc. F. W. Griffiths and W. H. McGuire, of Niagara Falls, are provisional members.

* * *

National Business Methods and Publishing Company, a New Jersey corporation, has been granted a license to do business in Ontario, using any sum up to $50,000 in printing, advertising, publishing works of fiction, trade journals, magazines, etc., and in publishing business and other public systems.

* * *

The guarantee by the Ontario Government of the loan of a million dollars to the Lake Superior Corporation is to be renewed for a period of three months. The guarantee was originally for $2,000,000, half of the loan having been since discharged. Before the loan and guarantee comes due again the Government expects a further payment may be made on the principal.

* * *

Canadian Pulp-Wood Co. has been incorporated with a capital stock of $25,000, with headquarters at Acton, P.Q. to acquire timber lands and to deal in wood.

The charter members are: T. Lovett, physican; Patrick Lovett, farmer; Ludger Gauthier, commercial traveller; Emile Racicot, merchant tailor; J. L. Edmour Lippe, goldsmith, all of Acton.

* * *

The Harmsworths of London, publishers of the London Daily Mail and other newspapers, are reported to be buying 150 sections of timber limits on Vancouver Island, 35 sections having already been bought in Quatsino district, and options on 33 more are being cruised, which will be bought if satisfactory. This is their first investment in British Columbia, though, as our readers are aware, they have large holdings of pulp-wood limits in Newfoundland and New Brunswick.

* * *

The National Stationery Company, Toronto, brought an action against the British-American & Traders' Fire Insurance Companies to recover $10,000 for losses incurred through a fire in the former's premises, and which the companies declined to settle. In the cross-examination P. C. Taylor, manager of the Stationery Company, admitted that his claim for $8,000 for losses on stock was based on selling value and not on its cost price. Contradictory evidence also was given as to the company's financial standing. Among the witnesses was Hon. J. D. Rolland, from whose company the National had been a purchaser of paper.

PACKER'S OPEN SIDE SECTIONAL DIAPHRAGM SCREEN.

The Sandy Hill Iron and Brass Works, Sandy Hill, N.Y., are sending out a catalogue describing their Packer's New Open Side Sectional Diaphragm Pulp Screen. In this any number of screens may be set in line end to end, coupled together, driven from either end, and so arranged that any shaft may be uncoupled and removed from the screen sidewise, easily and quickly when required. The working parts are practically the same as used on this firm's Original Packer Screens of which over 700 are in use in the best mills in the United States, Canada, Sweden, Norway and many other countries, and it is worth noting that they have never had a screen rejected for any cause whatsoever. These screens are in operation on all kinds of sulphite, soda and ground wood fibres and on all kinds and grades of paper and box-board stock.

MARKET NOTES.

By a peculiar turn in the British markets paper stock and rags are higher in England than in Canada, while pulp is lower, prices being such that no movement is now taking place from Canada to the Old Country except on contract.

At points in northern Ontario, spruce and balsam pulp-wood, which sold at $5 and $4 respectively at the sidings last year will sell at $4 for spruce and $3 for balsam. In other words pulp-wood generally in Quebec and Ontario is likely to drop $1 a cord below prices of last season.

Mechanical pulp is quoted at $24 a ton delivered at New York and New England mills, being equivalent to about $16 at Canadian mills. No. 1 sulphite, unbleached, is $2.10, and No. 2 is $1.95.

—A Swedish specialist in soda pulp and Kraft pulp writes us that he would be willing to make an engagement to come to Canada to manage a Canadian mill or to construct a new mill. The address can be had at this office.

—Reginald H. Mardon, head of the printing branch of the Imperial Tobacco Company, of Bristol, Eng., has been visiting Canada. Mr. Mardon, who is accompanied by Mrs. Mardon, has visited some of the Canadian Paper mills, and the result may be the opening up of some new trade connections with the British market.

NEWS OF THE MILLS

Price Bros., Ltd., are now operating their sulphite mills at Jonquieres, P.Q.

* * * *

It is said that the Chicoutimi Pulp Co. are investigating the question of making Kraft paper.

* * *

The Riordon Paper Mills, Merritton, Ont., resumed operations in full towards the end of last month.

* * *

The forest fires in Quebec Province have destroyed many thousands of cords of pulp-wood, especially along the line of the Quebec Central Railway.

* * *

Owing to dry weather and other causes mills both in the Ottawa valley and Eastern Townships have as a rule been running only about half of their grinders.

* * *

The Beaurinage Lumber Company, recently incorporated under Quebec laws with a capital of $25,000, is authorized to own and operate pulp and paper mills.

* * *

The Don Paper Mills, Toronto, have been fitted up with new machinery and thoroughly renovated. It is not expected, however, that operations will be started before the new year.

* * *

The Nicolet Falls, P.Q., pulp mills, owned by A. J. Morrill, have been taken over by a company of which Mr. Chadsey, formerly of the Dominion Paper Mills at Kingsey Falls, will be manager.

* * *

The Canada Paper Company have plans prepared for further water power development at Windsor Mills, P.Q., and for the erection of a new machine shop about 85 ft. by 170 ft. and new finishing room about 100 feet by 100 feet. They will also rebuild the beater room.

* * *

The Algonquin Lumber Company has purchased the holdings of the Quatsino Pulp Company, and intends to erect thereon a pulp mill to cost a quarter of a million dollars. Machinery already has been ordered.

* * * *

Charles Morin, foreman in the E. B. Eddy Company's paper mills, met with a tragically sudden death on the 14th inst. He was in attendance at a political meeting and was in the act of clapping his hands when he fell dead through heart failure.

* * *

The Lincoln Paper Mills Company, which some time ago purchased the large Lybster cotton mill at Merritton, Ont., has given orders for a large gang of men to put the premises in shape for the installation of a modern paper mill plant.

* * *

The Spanish River mills at Espanola, Ont., have been running on half capacity. Water, however, has been satisfactory. The company will only operate probably four camps in the woods this year. Wages for cutters this year are markedly less than last.

* * *

The Ottawa Pulp & Paper Company, who expected to have their reduction process in operation some weeks ago, were prevented by the lowness of the water. This company are developing the Cornell process of recovering the waste from pulp mills, and an improved machine for this process is now nearly ready to operate.

* * *

The Booth paper mills are now turning out 95 to 100 tons of news per day, but have to buy a large percentage of their pulp. Their own pulp mills are doing no grinding, as about three quarters of their water power is off, owing to the low state of the Ottawa River. The new sulphite mill, which started in July, is turning out good fibre. Its present capacity is 40 tons per day, and practically all of its output is used in the news mill. The ultimate capacity of the sulphite mill will be 60 tons per day. The output of the news mill is being shipped to the United States, Australia and Great

Britain. Mr. Booth will add a board mill to his present large establishment in the near future, but the date of its erection is not yet decided.

* * *

A. E. Edmonds, of Appleton, Wis., who, it will be remembered, put up last year a deposit of $100,000 on the purchase of the Spanish River Pulp & Paper Company's mills and timber areas at Espanola, Ont., is now taking action in the United States courts for the return of the amount. He claims to have discovered certain points in the contract which should be null and void and not as represented by the company. The entire amount involved is $2,160,000.

* * *

P. J. Mullin, of the Pigeon Lake Sawmill Company, at Millet, and some capitalists associated with him are working on a project to establish a million-dollar pulp factory in Edmonton, which would employ 700 men. Abundant raw material is at hand. If the river could be harnessed, he thinks that the plant could be established on a sound basis. He is now engaged in studying the problem of utilizing the water power of the Saskatchewan.—Edmonton News.

* * *

Although during the past month the Ottawa River has been below any recorded levels since 1876, and all the mills are badly hampered for want of power, there is some compensation, however, as the low water greatly facilitates the operations on the extensive dam now being constructed by the joint efforts of the E. B. Eddy Company, John R. Booth and the Dominion Government, to provide storage above Hull and Ottawa for the big power users. The dam, the contractors for which are Quinlan & Robertson, of Montreal, will cost $250,000, and will be of the bulkhead construction, with 50 openings of 22 feet each. It will be of concrete and steel, and electric travelling cranes will operate the stop logs. Men are working on it night and day.

"CELL PITCH."

Utilization of Waste Lyes from Sulphite Wood Pulp Manufacture.

The question of the disposal of the waste liquors from the manufacture of wood pulp by the sulphite process has always been a difficult problem, in the case of those mills working in populous districts without an outlet to the sea or a large river. Such conditions exist in certain parts of Germany, and numerous efforts have been made to deal with them.

W. Sembritzki, manager of the Walsum Paper Mills, on the Rhine, describes in the "Wochenblatt für Papierfabrikation," the methods by which these lyes are not merely disposed of, but actually turned to profit. In the immediate neighborhood of the pulp mill a factory has been erected for the conversion of the sulphite wood liquors into a solid pitch called "cell-pitch." The hot liquors discharged from the digesters flow through lead pipes into cement lined reservoirs. From these the liquor is pumped into wooden vats in which it is neutralized with lime. After filtration through coke the liquor which is now nearly black, is pumped through an economizer, in which it is heated to nearly boiling point, and passes thence to the evaporators. These reduce the liquor to a syrup of a density of about 35° Beaumé, a large quantity of which is packed in iron drums and sent to England, where it is used as a binder for the sand moulds used in casting. What is not thus utilized is evaporated to dryness by means of steam-heated revolving drums, which take up the syrup in a thin layer and evaporate most of the residual water; the crust is removed from the drums by scrapers, and falls into boxes in which it solidifies into blocks containing about 10 per cent. of moisture. From 500 tons of waste lyes 50 tons of "cell-pitch" are obtained, and the fuel consumption is reckoned at one ton of coal per ton of pitch.

This pitch looks like rosin, but it is quite soluble in water. It is used as a binder for briquettes, not only for fuel but for ore smelting. By its means the dust from blast furnaces, containing 40 per cent. of iron, and hitherto a waste product, has been formed into briquettes for resmelting. It has also been used as a dressing for coarse canvas, etc. It is sold at 50 shillings per ton.

NATION BUILDERS OF THE NORTH

Under the above title the Boston Herald of October 4 had this to say about John Rudolphus Booth, of Ottawa:

"Booth's shrewdness and foresight are proverbial. Some years ago he decided to branch out into the paper-making industry on a large scale, having already been quite successful with a pulp mill, regarded as not a particularly important branch of his works. His new paper mill just completed and built under his own personal supervision is one of the very finest on this continent. To feed it, in addition to the pulp-wood on his timber limits proper, Mr. Booth is able to draw immense quantities of pulp-wood from a concession on the Montreal River.

"The right to cut this pulp-wood for a period of twenty-one years (the land remaining the property of the Government) he obtained from the Ontario Government in open competition. He staggered the Government and his competitors by bidding a bonus of $300,000 in addition to the fixed dues, which will, in the aggregate, reach an enormous total.

"Wiseacres shook their heads and declared that John Booth had at last made a mistake; now they are beginning to realize that he knew better than all the other bidders and their experts, and the Government put together, the richness of the pulp-wood on that concession.

"Paper from his mill goes to the United States in spite of the heavy duty, and Mr. Botth makes a profit on it, too. Part of his output of lumber goes out in finished commercial shape from his lumber yards at Burlington, Vt."

PUTTING ON A NEW WIRE.

Without doubt the wire is the most costly and most delicate of a machine's equipment, and is more than worthy of the attention usually bestowed upon it by the machine tenders, says an old paper-maker, writing in Paper Trade Journal. The wire makers themselves are also influenced by the time and money it takes to produce a wire, and in packing it for shipment to the paper mill they endeavour to accomplish the act in a manner that will guarantee a wire perfect, when it is unpacked at the mill. The wire man's intentions are good, and it is too bad that his efforts do not accomplish all he desires; nevertheless the fact remains that at least 25 per cent. of wires shipped from the wire factory as perfect are found to be damaged to such an extent when unpacked that they are rejected by the paper-makers.

In very few of these instances is the maker of the wire to blame for the condition of the wire; most of the damage is done by careless handling by freight men and express men, who take much pleasure in seeing how hard they can toss it around, regardless of the written precautions on the box. Most shippers stencil on the wire boxes, "Do not stand on end," "Fragile," "Handle with care" and so on, and it seems to have on effect upon the man that keeps things on the move, for the writer has seen these boxes in freight houses and in cars, standing on their ends; he has also seen them handled by these same freight men as if they were a bag of potatoes, and yet it is the wire maker that must stand the cost, after he has vainly tried to explain to the paper-maker that the wires were in perfect condition when they left the shop. The machine men when opening a wire box

are usually more careful, as they have some respect for a new wire, the floor where the wire is to lie while the blocks and nails are being extracted from the wire pools is carefully swept, and the wire when unwound two or three turns is closely scrutinized for marks, and the wise machine man will refuse to put it on his machine, and by so doing relieve his employers from much difficulty in convincing the wire-makers that the wire was received in a defective condition, or should the wire show defects when placed upon the machine, before being turned around, much unpleasantness will be avoided by removing it and placing it in the wire box, to await inspection by the wire-maker's agent.

Much feeling is displayed between the paper-maker and the wire-maker when a wire that has been turned on the machine is complained of. The wire men will not believe that it was not damaged by the machine men, and will cite instances of where the same thing has happened before. No matter how small the defect in a wire it should never be placed upon the machine until seen by one of the wire-maker's men, for then should it develop into something serious the wire people will have to stand for whatever expense it involves upon the paper-maker. The wire-maker as a rule is very liberal in his treatment of paper-makers regarding damaged wires, providing he has seen the wire before it is placed upon the machine, and he realizes as well as the paper-maker does just how wires become damaged while in the box. The jams or dents that are sometimes found upon a wire are usually caused by the box being allowed to fall or drop, and the one remedy that will do much toward overcoming this fault lies in adopting heavier and larger wire poles upon which to wind the wire for shipment. Some makers are not to be pitied for the trouble they experience from customers, for they are so economical in the matter of wire poles that they almost deserve to suffer in consequence. At the present time, outside of complaints such as those just described, the wire-maker is free. Kicks on bars in the weaving of the wire, unevenly stretched wires, and so on, are growing scarcer every day, and if the wire man can pack the wire for shipment in a manner that will defy the attempts of freight handler to injure it, he will have little complaints from the paper-maker.

Machine men are noted for their carefulness in handling a wire when placing it on a machine, for to them it is the most disgraceful thing imaginable to have anything happen to it at that time. During this process the machine men swear and yell if one of the helpers becomes a bit careless, and the delicacy of touch that they exhibit is worthy of an old painter's brush. After having safely unrolled the wire and put into place the breast roll, the work proceeds in the same careful manner, and when the last roll is in position and the wire free from marks everyone takes a breath of relief, for it is no small job to place a finely woven wire upon a machine without meeting with some mishap that will slightly mark it. After the wire is declared on it becomes the solemn duty of the machine man to strike in the lever and give it its first run on the course it is expected to travel for some time. The nervousness displayed by some machine men on this occasion is remarkable; they sometimes get it into their mind that just as soon as they start that wire something is going to happen to it. This idea is usually most prevalent at night time, and many a poor machine tender has been afflicted by something resembling St. Vitus' dance as he was about to strike in a new wire.

The proper way to start a new wire is to let the stretch roll lie on its own weight upon the wire before putting the top couch roll down, thus avoiding any possible strain upon the wire. After the top couch is in position every bolt or nut that was touched in the process of putting on the wire should be carefully tried to be sure that they will not become loosened later on. Before putting the wire in motion it should be thoroughly squirted with a powerful stream of water

to guarantee it being free from lumps of dirt or wood that might come from the save-all boxes. When all is ready to start it one man should play the hose upon the stretch roll, and two others should take a position on either side of the wire as it passes between the couch rolls, so that should any hard substance happen to appear they could have the wire stopped and clean it off. A careful and cool headed man should be at the lever to start and stop the wire as he was told. When such precautions are taken the chances are much in favor of a perfect job in putting on a wire; it is rush and carelessness that cause accidents. When a machine tender or boss is continually yelling at his help to hurry while putting on the wire it is a safe bet that he is not a clever man at his business; of course time is valuable to any mill, but what is an hour's time compared to the destruction of a new wire? An incident occurs to the writer's mind that well illustrates the result of too much haste in putting on new wires. The boss machine tender in this case was new to his job and was looking for records; he wanted everything done quicker than it was ever done before, and tried to impress the help with the importance of time. A wire was being put on a 100-inch machine and everyone was working as fast as he could; things were being handled a little more carelessly than they ever had been before, for the boss machine tender's predecessor had always insisted upon carefulness in handling everything connected with the wire, and now the men were forgetting their early teachings and were striving to see in just how short a time they could accomplish their task. Several times there had been narrow escapes from damage to the wire, but the climax came while the boss machine tender was telling the "super" that he had put the wire on in one hour. At that time the young machine tender who was running the machine was hustling to get the paper on the wire and, neglecting to go over it to see if everything was secure, the paper was run on and was taken from the couch on to the first felt, and just at that moment the "super" and the boss machine tender happened along and noticed that a very fine streak was appearing on the sheet, about ten inches from the front edge of the paper. Closer investigation revealed the fact that the paper was actually being cut in two by something, and they naturally supposed it was a string of stock that had caught upon the slice; but in this case it was not, and a second later they discovered that the wire was cut all the way around it as cleanly as if it had been done with a sharp knife. Nobody said a word until the cause was found ,and it was this: The slices were secured in the middle by means of a bolt, a thumb bolt and a round nut, which was on the outside of the slice next to the dandy roll. In removing the slices when putting on the wire this nut was loosened, and in his hurry the machine tender failed to tighten it when he replaced the slice; as a result it had fallen off on to the travel wire, and when it had come to the dandy roll the pressure of that roll upon it had caused it to go through the wire and get caught upon the top edge of the suction box next to the dandy roll; there it had remained until it had split the wire all the way around it, and there it was found when the wire was stopped. Of course there was murder in the air; the "super" told the boss what he thought of his method in getting out records while putting on wires, and the boss tried to say that the machine tender should have tightened the screw before starting, but the machine tender swore that he was hurried so much that he had forgot, and also swore that he would never hurry so much again. No more records were broken in that mill; in fact extreme caution was the watchword forever after during that boss machine tender's administration.

—Erratum.—In the Paper Stock Market report on another page the quotations for waste papers should read 35 to 50c.; domestic white rags, $2 to $2.25; bagging, 50 to 70c.

METHOD FOR STRAINING WASTE WATER.

Two Norwegians, Halvor Gaara and Eilif Hem, of Telemarken, have been granted United States patent No. 898,212, for a method of straining the waste water in paper mills, wood pulp factories and the like.

The invention consists in a method of and apparatus for straining the waste water in paper mills, wood pulp factories and the like.

When recovering the finely divided short fibres contained in the waste water in paper mills, wood pulp factories, and the like, by means of the well-known cylindric strainers a considerable quantity of the fibres passes through the pores or openings of the strainer cloth and is lost. By using a very fine strainer cloth the loss of material would be less, but on the other hand the drawback then arises that too fine cloths are very quickly worn out and the fine pores of the same are choked up already after short use. It has been proposed, in order to remedy these defects, periodically to supply asbestos fibres to the filtering apparatus, in order that such asbestos fibres may make the strainer of the drum tighter. A periodical supply of long fibred stuff is not, however, applicable in the apparatus employed for clearing the waste water in paper mills, wood pulp mills and the like, owing to the considerable quantities of water to be cleared. If a considerable quantity of water is to be cleared by these apparatus, it is necessary that the mass deposited on the cylinder should be continually removed from the same; but if this is done, the long fibres will then be simultaneously removed; for an efficient means of removing the short fibres without simultaneously removing the subadjacent filter layer, which consists of long fibres, is not yet known. These drawbacks are avoided by the present method according to which a strainer is employed for recovering the short fibred material, long fibred material being continually fed to said strainer in such a way as to enable it to deposit itself on the continually rotating cylinder, before the short fibred material is filtered through the filter layer thus formed.

The arrangement, according to the present invention, consists in providing along the whole length of the cylinder, where the strainer passes down into the water, a separate space, into which relatively long fibred material is continually fed, for the purpose of causing this mass to deposit itself on the cloth in the said compartment and to form, on the outer side of the cloth, a filter layer, which prevents the relatively short fibred mass, contained in the liquid to be cleared, from passing through the strainer during the further movement of the same through the container.

The relatively long fibred mass is passed from a conduit to a separate department which is located where the clean strainer cloth passes into the liquid. In this compartment the long fibred material, during the rotation of the drum, is continually deposited unimpeded by the short fibred material outside the said compartment. In spite of being, without interruption, continuously filtered, the latter material, therefore, only gets into contact with long fibrous material already completely deposited, whereby loss of short fibrous material is avoided, and the use of comparatively coarse meshed strainer cloth rendered possible. The inlet channel can, of course, also be located at the opposite side, in which case the wall may be disposed so near the cylinder at the opposite side as to replace the screen provided to form a wall of the compartment. A certain amount of fibres of the long fibred mass fed to the compartment will always pass through the cloth, before the filter layer has been ready formed. In order that such fibres may not be lost, the apparatus, according to the present invention, is provided with a cylinder of the known type, that conducts the water passing through the cylinder cloth and containing the material in question,

away from the clean water subsequently discharged.

In apparatus designed for straining the exhaust water from wood pulp mills, the long fibred material may be obtained from the inlet channel to the pasteboard machines or the decker machines. In a paper mill combined with a wood pulp mill or a cellulose factory the long fibrous mass to be supplied to the clearing apparatus for the water discharged from the paper machines is obtained from the pulp mill or the cellulose factory.

If the strainer for any length of time operates without being inspected, and the apparatus in consequence hereof for some reason or other should stop, the material would be lost, owing to the long fibred material's flowing over the container. To avoid a loss of material occasioned hereby an overflow channel is provided above the normal water level, through which channel the long fibred material, when required, may flow out of the container, and, by way of a conduit or the like, be discharged into the pulp containing water flowing from the strainer or cleaning apparatus. The mass deposited on the strainer cloth is carried off in a well-known manner by means of a roller and a scraping device or by other known means. The mass flowing from the roller may, in some cases, be discharged from the container, together with the water, and in a manner previously known be returned to the pasteboard machines or the decker machines to be utilized in the same. A screen that may be variously disposed is designed to prevent the mass flowing from the roller from sinking to the bottom.

SIZING PAPERS.

Many resins, but more especially common rosin, readily dissolves in alkaline solutions, such as a lye made of caustic soda. The compound thus formed is an alkaline resinate of soda, which remains in liquid form, but by the addition to such fluid of a solution of a metallic salt, such as sulphate of alumina, sugar of lead, etc., the resin is precipitated from the alkaline solution in the form of a resinous mass. It is, in fact, become a resinate of alumina, or of lead, because the resin has forsaken the soda salts to combine with the metallic base of the alumina salt or lead acetate.

Now most of these metallic soaps are unsoluble in water, and, therefore, are made use of by the paper maker as a sizing compound for rendering paper nonbibulous, by which the paper is rendered more or less waterproof.

As there is no great difficulty in preparing these resinates or metallic soaps, the writer intends to give simple instructions for their production, whereby the paper maker can make his own sizing compounds. By dissolving resinates in oil of turpentine very useful soap varnishes are obtained, which can be utilized in coating the surface of paper to render same waterproof.

The alkali used should be pure, or refined caustic soda; if contaminated with carbonate or sulphate of sodium the resulting resinate will not be perfectly soluble, because insoluble carbonates and sulphates will be produced when the resin is precipitated by the addition of metallic salts.

The production of the resinate is effected thus—an alkaline lye is made containing a requisite quantity of alkali, and then the rosin boiled in the lye until dissolved; the rosin is then thrown out of solution by adding a solution of a salt of an alkaline earth, such for example as sulphate of magnesium, whence the compound by the union of the resinic acid with the potash or soda is precipitated.

The resinate, as it is called, is soluble in water, but the compound (i.e., metallic resinate) which is precipitated is not soluble in water.

As already stated, other metallic salts can be used, such as the sulphate of copper, iron, etc., but the resinates thus produced will vary in their solubility in various solvents, because the salts of the alkaline earth are more soluble than those of metals.

The proportionate amount of rosin and alkaline required to produce the resinate is calculated from the following data: First test the caustic alkali for its purity or freedom from sulphates, silicates, sulphides, and then ascertain the exact value in caustic alkali (soda).

This is ascertained by taking its specific gravity, where reference to a table of such values will give the actual amount of sodium oxide present in the caustic alkali.

Separately a sample of the rosin should also be tested so as to ascertain exactly the quantity of alkalis necessary to saponify it completely. The richness in caustic alkali is calculated in percentage of Na_2O—that is to say, 80 per cent. from the caustic soda analyzed; the soda corresponding to silicate of soda must be deducted, as the resinic acids have no action on it. Supposing therefore in the analyses of 1,000 parts by weight of rosin has been completely saponified by 190 parts of pure caustic potash, this quantity is converted into, by calculation, therefrom. As the soda used only contains 80 per cent. of true alkali, we shall have to use 20 per cent. more of this soda, and we prove that 62 parts of soda have a saponifying power equal to that of 112.2 parts of caustic potash.

WATERPROOFING PAPER WITH CASEIN.

A German contemporary states that lactalbumin is a commercial form of casein which is sold ready mixed with sufficient alkali to dissolve it, and which is largely used in paper staining as a substitute for the shellac varnish. In order to use casein for making a waterproof coating for paper, ordinary insoluble casein is steeped in three times its weight of warm water and allowed to remain for ten or twelve hours. The excess of water is then drained off and replaced by fresh warm water; the casein is then dissolved by adding one-tenth of its weight of liquid ammonia and stirring continuously until no more white grains can be seen. The liquid is then diluted with water until it is of the right consistency for spreading on paper. A portion of this solution just sufficient for immediate use is then taken and mixed with one-tenth per cent. of a 10 per cent. solution of formaldehyde. (N. B.—Commercial formalin is generally a 40 per cent. solution of formaldehyde.) The mixture is well stirred and applied evenly to the surface of the paper with a sponge. In order to prevent setting it is advisable to keep the mixture warm and to stir it frequently. The water resistance of the coating may be increased by increasing the proportion of formaldehyde, but in that case the danger of setting is also increased. If the paper or cardboard to be treated be well sized, the solution may be applied direct, but if it be soft sized it is advisable to give a preliminary coat of starch paste or glue in order to close up the pores of the paper before applying the casein; or a more dilute solution of the same mixture may be used for this purpose. Articles made of paper or pulp may in this way be rendered perfectly waterproof; vessels, plates, etc., thus treated will hold water for a whole day without becoming soft.

ST. FRANCES DEVELOPMENT.

According to the St. Frances, Ont., Times, work will be again resumed on the big power dam within a very short time, and the foundations of the mammoth pulp and paper mills will be put in before winter. The statement is also made that the entire works on the Fort Frances side will be fully completed and in running order by April 1st next. This is really good news, to not only Fort Frances, but to the district, as the completion of the dam here and building of mills means a great deal, not only to the citizen, but to the settler. Once we get electric power other industries will follow, and the next two or three years will witness a marvellous growth in our

town. We have waited long and patiently to see the immense water-power harnessed and in use, and now that our ambitions and hopes are about to be realized we will have our confidence renewed and our material prospects greatly enhanced. The men who are at the head of the pulp and paper industries are capable of carrying out anything they undertake, and it is gratifying to all concerned that this is the case.

W. Cook, President of the Duluth, Rainy River & Winnipeg Railway Company, addressed the citizens of Fort Frances, Ont., recently, and stated that he was ready to go ahead with the construction of a pulp and paper mill, to employ 300 hands in the summer and 1,500 in the winter.

DUST IN PAPER-MAKING.

Some of the raw material for paper-making is obtained by tearing up rags. These rags are of every possible origin and are generally very dirty, and the people who prepare them for the paper mill have to abandon the work at once in many cases. The regular hands are those who have been acclimatised and have escaped the bronchitis and pthisis which have attacked their less robust sisters. M. Galinon, factory inspector at Angouleme, who is thoroughly versed in the paper manufacturing trade of the Charente, says that once a woman working in a rag place gets anything wrong with her chest she soon dies. In Austria, it has been observed that there is a special rag-illness, whereof the symptoms are vomiting, cold sweats, and œdema of the lungs. Fourteen deaths from this complaint have occurred in one year among the women employed in one rag-sorting factory.

This shows that the danger of inhalation of dust from rags is very real. M. Poincare suggests that the rags should be sprinkled with chloride of lime solution before the sorting begins. A still better plan appears to consist in the compulsory wearing of a mask by the women. There is, of course, the difficulty to be met which arises from the carelessness of the workers. Mineral-water bottlers who provide gauntlets and masks for their workpeople know how often these protections are left lying about the shop. If, then, there is any trouble of this nature the rags should be treated first, if it is only with water, in such a way as to prevent any dust flying about. These precautions, however necessary in small scale working, are out of court when dust is got from rags in such quantities that it is profitable to collect it for use either as manure or as an addition to the pulp employed in the manufacture of the cheap papers, as circumstances may dictate. Various machines have been devised ad hoc, and those invented by Voith and Lumpf deserve special mention. Both are admirably suited for removing the dust from the rags and for collecting it for use in any way that may be desirable.

Dust is also obtained when old paper and cardboards are worked up. They are as bacteriferous, as a rule, as old rags, and the use of the dust is the same as that of the dust from rags, for obvious reasons. Hence this paper debris should be treated exactly like debris from rags. Some rag-sorters put them through a cylindrical sifter, built on the same principle as that attached to a stone-crushing machine, but the stuff from the devil is so light that the sieve acts rather efficiently, and the rags leave the sifter still containing dust which has lodged in the interstices of the fabric, and which consists partly of foreign matter and partly of fragments produced by the wear of the fabric itself.

—The autumn meeting of the Paper-makers' Association of Great Britain and Ireland, incorporated, will be held on October 29th. Capt. E. Partington, the vice-president, in the chair. Several important papers are to be read and there will be the usual dinner in the evening.

INFLUENCE OF THE HOLLANDER.

Not only do the materials used in the manufacture of paper exercise a decisive influence upon its quality, but the properties corresponding with its prospective uses can only be obtained by the proper treatment of the pulp during grinding. However varied are the purposes for which paper is employed, equally different are the methods of working the materials in the hollanders. This working alone determines the final result, as the machine only makes into paper the pulp already prepared in the hollander. Whether the draining and drying of the paper are quick or slow and how it comes up as to appearance, transparency, strength, etc., depend upon the character of its preparation, lower or higher cost of production also resulting therefrom. There is an old paper-maker's proverb: "The paper is made in the hollander." Hollander work needs great attention and calls for skill on the part of the paper-maker, only to be acquired by practical experience combined with theoretical knowledge; all the more as no established receipts exist for such operations.

Extremely varied are the properties required in printing, drawing, writing, blotting, wrapping and wall papers, as well as in other kinds, the different compositions of material needing each time a different kind of grinding, in order to produce pulp with long, short or medium fibres, and in various degrees of fineness. For some purposes the fibres are cut short, while for others the fibres are crushed and longitudinally split until a gelatinous mass is obtained, in which under the microscope there is scarcely any fibrous structure discernible. Upon the consistency of the material introduced into the hollander and the nature of the grinding depends the character of the paper. When the material is thin a less transparent, flat, heavy feeling paper is usually produced, which changes but little under different degrees of moisture, the pulp easily draining on the machine and the paper drying more quickly. The thicker the material, with suitable grinding, the more perfect is the felting of the fibres into a firm, tough, transparent, hard and thin feeling paper, varying in elongation according to the degree of moisture, and lying less uniformly flat. The draining of such pulp on the wire and between the presses of the machine is all the more slow and difficult, the drying on the cylinders being relatively slower, and the cost of production thus being higher. Papers from long fibred materials are irregular as to their transparency, while the shorter the fibres are ground the more easily and uniformly can the papers be rendered transparent on the machine.

Linen fabrics, cotton, cellulose, waste paper, etc., all require different treatment in grinding, upon which depends the final result, as well as the cost of production. This is why some factories lose money in the manufacture of various classes of paper, while other mills in less favorable situations can make a better article with profit.

The grinding of the materials is partly effected by the speed of the cutting rolls which tear the fibres, but principally by the grinding appliances. (The cutting rolls are the foundation of the hollander.) According to the sharpness of the knives and the pressure with which those on the rolls come into contact with those of the foundations, the materials are cut, split, crushed or ground.

In proportion to the sharpness of these two sets of knives and the fewer their number the greater is the superficial pressure of the former on the latter, corresponding with the smaller surfaces of contact at an equal pressure from the rolls. In this case the fibres lying between the knives are cut through as with a pair of scissors. The superficial pressure of the cutting rolls on the knives of the foundation is diminished in proportion to the greater number of knives and the larger cutting surfaces, these influences working simultaneously together. With diminished superficial pressure the fibres coming between the knives are

(as with a dull pair of scissors) rather crushed and split than cut through. The wider the cutting surfaces in knives close to each other on the rolls and the foundation the more are the crushed and split fibres ground into atoms.

It is natural that solid materials like linen and cotton should sometimes require a greater pressure of the knives on each other than if tender materials were being ground. The consumption of power, the time and the expense of treating the material, depend upon the efficacy of the grinding appliances; these items being less costly, the better such appliances are suited for bringing out the qualities which the paper should possess. No paper mill can, however, be expected to have as many grinding equipments as would correspond with the prospective variations in materials and in the properties of the paper to be made. They can only provide for the requirements in these respects of their special products. As, however, changes result from wear, this fact should be taken into account by regulating the consistency of the material treated, or the pressure of the two sets of knives on each other.

In working up different raw materials for use in the same paper in order to obtain the desired properties in the latter, the length of time for grinding each may vary. Thus part of the material may be subjected to a preliminary grinding, previous to the addition of the balance of the material, when the whole would be treated together. This is the case in working up waste paper when intended for use in grades better than the wrapping paper for which it has hitherto been principally used, the preliminary treatment facilitating the complete utilization of the properties of the stock. In such cases it is for the technical paper expert to give the necessary instructions.

To the general question of hollander work also belong those of the sizing and coloring of pulp, the former process being in nearly every mill subject to different influences, particularly to that of the water used in the manufacture. When the water is soft a relatively small quantity of the sizing agent is required for attaining the desired result, the quantity having to be increased in proportion to the hardness of the water. The accurate determination of the reasons for this fact is dependent upon an examination of the water in question.

In a good sizing (whatever may be the character of the water) the important point is for the size (particularly rosin size) to have been thoroughly subjected to working and grinding before it is added in a fine emulsion to the pulp. The finely divided size encloses the separate fibres and is bound by alum. Further grinding of the pulp again removes the layer of size from the fibres, the size when once separated not adhering so closely to the pulp as before and a good deal of it being lost on the paper machine. The finer the pulp is ground the less of the agent is needed to produce a given strength of sizing.

Coloring pulp in the grinding appliances depends upon the colors or shades desired, and according to the nature of the latter, takes place before or after the sizing. Many colors require further binding agents or mordants to bring out their full effect and to become fast.

Here again the water used and the quality of the material to be colored exercise an influence. Owing to the various requirements involved by different uses of colors and their fastness under such circumstances, definite coloring receipts cannot be given. It must therefore remain for the technical expert on the basis of his experiences and of the data given by the makers or distributors of the dyeing substances to effect the coloring of the pulp under treatment.

SMOOTH SURFACES ON PAPER BOARDS.

The "Papier Fabrikant" says that almost all the boards made on long wire machines are more or less uneven and

rough upon the upper side, the machines referred to being on the same general principle as paper machines, with such differences as the nature of the product calls for. It is further stated that this roughness of surface is more apparent in proportion to the thickness of the board.

In order to give such boards as even an upper surface as possible, it is recommended to bring the pulp on the wire containing a good deal of water, making the oscillations uniformly rapid and short, so that the water is retained as long as possible. With boards weighing 24½ ounces per square metre (1.19 square yard), 280 to 300 oscillations of about one-eight inch per minute will, it is said, give a good result.

As to the temperature to which the pulp should be brought, it should depend upon the thickness of the board to be made and upon the character of the grinding. For a board of the weight referred to above the right temperature would be 50 degrees C. (122 degress Fahr.).

TURPENTINE BY-PRODUCT.

As a source of profit possibly the least promising object imaginable is a Norway or "red" pine stump, rearing its unsightly stub from the soil which its presence renders unfit for cultivation. That these stumps were very resinous has long been known to a few persons. Relatively large sums of money have been spent in working out methods of recovering the rosin and its allied constituents, such as turpentine. These efforts have gradually met with greater success, so that within the last few years plants have been built which have extracted turpentine alone, and have met with moderate commercial success. Still other plants have first extracted turpentine, and have then employed very high temperatures to drive off the other contained products. This heat carbonized the wood, and thus destroyed its fibre.

After many years of exhaustive research and practical operation on a commercial scale certain parties have recently worked out a process whereby the valuable products may be separated from the wood, leaving the fibre perfectly intact and free from all but about two per cent. of intercellular matter.

Stumps which have been cut from 15 to 20 years lose, by decay, all their "sap" wood, or non-resinous portions, and it is found that the remaining parts are as clean and bright and strong as freshly-sawed timber. The first plant to make use of the newly-discovered methods on a commercial scale is now rapidly nearing completion at Cadillac, Michigan, being owned by the Cadillac Turpentine Company, of that place. The company's works will have a daily capacity of 50 cords of raw material, which is first reduced to five-eighth inch-chips in a common chipper, and is then passed through the several stages of the process, being finally discharged in a condition seemingly strikingly well adapted for the making of pulp.

Preliminary tests which have been made by practical paper mill men bear out the belief that these chips will make a very superior grade of sulphite. The owners are investigating and considering the use of this spent wood for the making of several special grades of pulp. All the parties who have studied the situation pronounce this to be an extremely promising source of raw material for a pulp mill located within reasonable distance of Cadillac.

LONGITUDINAL DIVISION OF PAPER WEBS.

Certain fashionable papers, especially letter-papers, have a rough edge. Hence many attempts have been made to split the web up into lengths while still on the wires, and in such a way that the line of division is marked by rough edges on both sides. This division can be effected by blasts of air, water, or steam, or by mechanical means. Among the methods belonging to the latter category we have the plan of closing the meshes of the

wires in the proper directions, so that the pulp cannot remain there, and passes over these places. Another method, which, however, has the drawback that it can only be applied for dividing the web parallel to the length of the wires, is to fix strips of cloth, felt, or India rubber along the whole length of the wires at suitable distances apart.

It must not be forgotten that once the paper has passed the couch rolls it is impossible, except at considerable expense, to get the rough edge for any but the most expensive papers; the division must take place on the wires. There are two reasons for this. One is that in its later stages of development the web is more compact and more difficult to cut up; the other is that there is naturally more waste of fibre.

As regards the methods for dividing the web upon the wires, which depend on the use of steam, air, or water, the greatest care must be taken that the jets are true in line and exactly where they are wanted. The edge has to be straight on the whole, and just ragged enough but not too ragged. Steam is the dearest of the three agents, but at the same time the most efficient, if its action is kept strictly within the area of the paper web where it is required. An objection to steam for this purpose is the damp atmosphere produced; and perfect ventilation is essential. The clouds caused by the condensation of the steam often make it impossible to watch the action of the machine, unless they are removed as fast as they are produced. Another very important thing, whether air or steam is used, is to prevent the pulp from reuniting on the couch-roll side of the blasts. The best safeguard against this is to have as much water in the pulp as possible. If there is still danger, the row of blasts must be lengthened. With water jets this danger is absent, but the supply of separating water must, of course, not exceed the capacity of the suction-boxes. It is also evident that whatever agent—steam, air, or water—is employed, the force of the jets must never exceed what is absolutely necessary. Excess not only means waste of steam, etc., but undue disturbance of the paper web. It will also be evident to every practical man that the strength of the blast from the jets must in all cases be regulated according to the nature of the pulp on the wires. As just stated, the working principle is that the force employed must be enough to tear the web, but it must not be more than enough. Many ingenious mechanical contrivances have been invented to use various blasts in the most efficient and in the most economical manner. We may possibly recur to this part of the subject later.

SPONTANEOUS COMBUSTION OF CHLORIDE OF LIME.

With refernece to the recent instance of the spontaneous combustion of a carload of chloride of lime at a paper mill, Dr. v. Possanner remarked in the Wochenblatt fur Papierfabrikation that the possibility of the spontaneous combustion or the explosion of chloride of lime when not properly stored is occasionally referred to in chemical literature, but that the real cause (or rather the chemical process) has not been, so far as he knows, elucidated. He therefore submits the following explanation:

Chloride of lime, usually known under the formula $Ca\begin{matrix}Cl\\OCl\end{matrix}$ is a substance very easily decomposed, particularly under the influence of damp or heat. When stored for a long time, even without the action of external influences, a decomposition takes place, expressed in the following equation:

$$2Ca\begin{matrix}OCl\\Cl\end{matrix} = 2CaCl_2 + O_2,$$

chloride of calcium and free oxygen being thus formed. In this transformation, however, a considerable quantity of heat is liberated, the mass rapidly becomes hot, and as there is a good deal

of free oxygen present any organic substance near (in this case the wood of the casks) can easily become ignited. The reaction of the above equation may lead to an explosion.

A second case of the combustion of chloride of lime came under the notice of Dr. v. Possanner. In this instance an external cause was present, as a vessel full of linseed oil broke and the oil took fire on coming into contact with the chloride of lime. In this case likewise there was a violent liberation of oxygen, accompanied by a considerable rise of temperature.

In recording the above facts Dr. v. Possanner expresses the hope that they will cause increased attention to be given to the storage of chloride of lime, remarking that there exists in many factories indifference on the subject, often arising from ignorance of the existing danger. He has frequently noticed chloride of lime stored in damp or warm locations. It was only by reason of favorable accessory circumstances that the instances referred to did not lead to destructive conflagrations.

LOWER COUCH ROLLS OF RUBBER.

In the Wochenblatt fur Papierfabrikation two paper-makers give their experience on the use of rubber covered rolls for the bottom couch roll. One states that the rubber rolls last a longer time and stronger stuff can be worked than with a felt jacketed roll. With a higher speed the rubber rolls give a better squeezed out web and the production is thereby increased. The other paper-maker remarks that he was forced to put in a rubber roll three years ago owing to the sudden breakdown of the axle of the bottom couch roll, and the rubber roll has been working ever since. The old roll was a bare copper covered roll, so that a difference in the character of the paper was immediately noticed. The printing paper came out softer and with more body, the wire marking was less pronounced and the paper retained more clay. The structure of the paper was better preserved and not crushed apart. Rubber rolls compensate any inequalities in the texture of the jacket of the upper couch roll. When the rubber surface becomes uneven by wear, it can be trued up without dismounting by means of Schnitzer's grinding tool, by which means also the surface of the roll can be made slightly convex if desired. Rubber rolls are particularly suitable for machines which work up much waste paper, since the presence of foreign bodies in the paper is not likely to do so much damage as with the unyielding copper rolls.

OPAQUE WRITING PAPER.

P. Savary has patented an opaque writing paper, primarily intended for private correspondence, but which can, of course, be employed for any kind of manuscript. The characteristic property of the paper is that it may be made opaque, not only to ordinary light, but also to the X-rays, so that it is impossible to decipher the MS. without opening the envelope. M. Savary glues together two sheets of any kind of paper —white or colored—and enclosing between them the layer of special substance which confers the necessary opacity upon the sandwich thus produced. The special substance may be a sheet of black paper, or it may consist of some substance dissolved in the glue which unites the two outer sheets, and possessed of the necessary radiation stopping power. Metallic salts are dissolved in the glue when it is desired that the paper should be impervious to the X-rays. In any case the paper may be made thin or thick as may be desired, and it will be evident that what may be called the insulating layer between the two sheets must be thicker in proportion to the entire thickness when the paper is thin than when it is thick.

LOW WATER AT OTTAWA.

The extraordinary drouth of the last few weeks has been attended with rather serious results on the operation of the Chaudiere mills. There has been a remarkable lowering of the water in the Ottawa and Rideau Rivers. J. R. Booth had to stop his lumber operations for several days. His mechanical pulp mill also closed down, with a view to allowing more power for other departments of manufacturing. The E. B. Eddy Co. also found great difficulties in the way of keeping their mills in operation, and one or two branches temporarily closed.

DRAWING PAPER.

The manufacture of good drawing paper requires special care and thorough technical skill, says Zentralblat. This class of paper includes two sub-divisions: the second quality, which contains wood pulp, and the first quality, which does not. Both are sold white or colored. The chief requisites of a drawing paper are that it should be thoroughly sized, that it should permit erasures to a reasonable extent not injurious to its texture, so that ink will not run on the scratched places, and also that it should be tough and strong. In addition to this, the sheet must lie perfectly flat, i.e., must be free from even the smallest lump or blister. If the paper is colored the dye must be fast to light, because the paper is often left exposed at a window on the drawing board for weeks together.

The following will be found to be an accurate description of a method for manufacturing a good drawing paper:—

Second-class drawing paper can be made by a skilful hand from wood pulp alone, without any rags at all, but the wood pulp must be of the best; and, of course, skilled pulp buying is essential. Special care must be taken that the fibre has not been tendered in the bleaching. Wood pulp that wants sharp bleaching will not do for the making of drawing paper. In some cases it is advisable to mix the wood with from 10 to 15% of bleached straw. This addition improves the white and also the "handle" of the paper; although the idea that it strengthens it is erroneous. Buyers of drawing paper pay much attention to the rustle, as they think that a clear-toned rustle means a good paper. The work in the hollander must on no account be done in too large a vat. Vats with open troughs and holding from 2 to 2½ cwt. at most of dry material are best. The stuff is worked up till quite greasy, which takes six or seven hours. The length of the separate fibres when the stuff leaves the hollander is of great importance. They must not be too short or too long. Pulp for white paper can be blued with ultramarine in the hollander. So far the process is the same for both wood pulp and for rag papers, but for the latter kind the sizing requires glue as well as rosin, if the paper is to bear two or three erasures without ink running at the scratched places. In addition to the rosin size about a pound of glue is added to the hollander for every cwt. of dry stuff, and from a pound to a pound and a half of starch should be put in at the same time to assist in giving the proper "handle." Mineral filling must be employed with caution, as the ash of a drawing paper cannot exceed from 10 to 12 per cent. if the paper is to be worth using. If filling is added, barytes is preferable to kaolin, which is apt to give the paper a greasy feel, and to destroy the rustle. Wood pulp drawing paper is made with rosin size only, and may give as much as 20 per cent. of ash. Intermediate qualites are made by mixing wood pulp with rag pulp, and the secret of making a good intermediate quality of drawing paper is to make the two pulps separately. As regards the paper machine, the draining on the sieve must be uniform for any kind of drawing paper, and must be slow, to allow time for thorough felting. The

drying must be gradual. Any attempt to hurry it, especially if the first cylinder is made too hot, will infallibly cause blisters. Again, drawing paper must leave the drying machine drier than ordinary papers, viz., with 2 to 3 per cent. of moisture, instead of the usual 5 to 8 per cent. Surface is given in a special press while the paper is still damp. The following table will give some valuable information about some of the more current machine-made drawing papers:—

No.	Weight. Grams. per sq. metre	Thickness. MM.	Sizing	Percentage of Ash	Mean Reisslauge in Metres	Composition of Stuff	Endurance of Erasure
1	180	.23	Very thorough	1.5	3,745	Linen, cotton, a little hemp	Very good
2	227	.26	Do.	7.3	2,613	Wood and straw	Good
3	140	.18	Thorough	12.4	2,991	Wood and straw	Very good
4	151	.19	Very thorough	6.2	4,170	Linen, cotton and wood	Extremely good
5	205	.24	Do.	3.1	2,102	Wood with linen and cotton	Very good
6	170	.20	Do.	2.4	3,969	Wood and a little straw	Very good
7	160	.98	Thorough	14.8	1,943	Wood	Satisfactory

BOILING MANILLA HEMP.

The preparation of pulp from Manilla hemp entails many difficulties. Chopping it up soon wears out the knives of the cutting machine, and the boiling of it is a tedious and troublesome process.

Some hemps coming to the papermaker consist simply of old ship ropes. Others are mixed with other fibres, such as cotton. Others again are old driving ropes covered with dirt and lubricating oil. These incrustations are quite as hard to get rid of by boiling as the tar in old ship ropes.

Old Manilla tows, especially those sold annually by the German admiralty and navy, are a highly prized article of commerce in the Fatherland, and are quoted on the Hamburg Exchange as fully as petroleum or iron. The papermaker sometimes buys the stuff ready chopped, but quite as often obtains it from dealers in old ropes. In agreeing as to the price regard must be paid to the amount of dirt present and especially to any admixture with fibre not hemp.

The hemp must, of course, be chopped up before being boiled. A small maker may have it chopped by women with choppers on a wooden block, but there are power-driven machines specially intended for the purpose.

The boiling must be thorough. Any dirt, tar or grease left behind will soon choke up the wires, to say nothing of their effect on the other parts of the machine or on the quality of the finished paper.

To boil 15 to 16 cwt of hemp, use 3½ cwt. of caustic soda, and boil for from 18 to 20 hours under a pressure of two atmospheres. Then rinse repeatedly with boiling water in the rotating boiler until the rinse runs off nearly clear. The waste lye, as well as the first rinse, will probably be nearly black. The hemp is now boiled again at two atmospheres pressure, but this time with milk of lime. After eight or ten hours' boiling, rinse and empty the fibre into a half-stuff hollander.

This process is evidently neither remarkably expeditious nor conspicuously

cheap, but it will be found that unless for exceptionally clean fibre no better method can be devised. Much may, however, be done in working on a large scale by sorting the hemp before boiling and boiling the various grades of cleanliness separately but simultaneously. The cleaner sorts will then be ready for the hollander first, and something may be saved by using the waste caustic soda from them for the dirtier hemps. It must not be forgotten, moreover, that the prime cost of the dirty tar or grease laden hemps is very small to a buyer who understands his business.—Papier Fabrikant.

THE HUDSON'S BAY RAILROAD.

An important step for the development of Northern Canada was taken recently, when a survey party consisting of one hundred men left Winnipeg to locate the route of the proposed railroad to Hudson's Bay. The survey is to be pushed with all possible speed. This will enable legislation to go through at once so that the work of construction may begin next year. John Armstrong, a well-known surveyor, who has had a long experience in railway construction work in the West, will be in charge, with Messrs. Murphy and Law, engineers of the Railway Department at Ottawa, as his assistants. The hundred men will be divided into four parties. They will survey alternate routes via the Churchill and Nelson Rivers. One party will go straight through to Fort Churchill and work eastward to the present terminus of the Canadian Northern at The Pas. Another party will follow the valley of the Nelson River to Port Nelson.

The ultimate choice of route will depend upon the character of the reports brought back as to the relative cost of construction, the suitability of the country for settlement purposes, the climate, etc. A careful examination will also be made of the harbor facilities at Fort Churchill and Port Nelson, and the Government will gather as much information as possible with respect to the probable cost of harbor works and aids to navigation in the bay and straits, so as to be in a position to give the fullest information to Parliament before legislation is passed providing for the construction of the road. The total distance from The Pas to Fort Churchill is 498 miles. A part of the country to be traversed contains, it is believed, large pulp-wood areas. This fact, as well as the richness of the territory in various forms of minerals, makes the construction of a railroad to Hudson's Bay of great importance for the development of the country.

PAPER STOCK MARKET REPORT.

Montreal, Oct. 16, 1908.

The general level of prices is much below that of last year, and at present is lower than it has been for some years. The scarcity of water power at present is checking the demand for rags, and at the same time increasing it for waste paper, particularly those qualities which can be used as a substitute for wood pulp. With the resumption of good water power we look for the gradual increase in the price of all paper-making material. We quote:

Unbleached cuttings	$4 00	to	$0 00
White shoe clips	4 50	to	5 00
Colored shoe clips	3 00	to	3 25
Domestic rags	2 00	to	2 25
Blues and thirds	1 25	to	1 50
Roofing stock	0 80	to	0 90
Manilla rope	2 50	to	0 00
Waste papers	0 90	to	1 00
Bagging	0 80	to	0 85

—Paper and paper products were imported through Vera Cruz (Mexico) during the fiscal year 1906-07 to the value of £713,840, an increase compared with the corresponding period of the previous year, when the value was £602,276.

CANADIAN FORESTRY.

Stanislas Gagné, A.M. Can. Soc. C.E., who will be known to our readers as a contributor some time ago of a very exhaustive but concise series of articles on Pulp Manufacture, recently read before the Canadian Society of Civil Engineers some "Notes on Canadian Forestry," in which he covered the subject in a very pleasing way. "The engineering profession," he said, "is specially interested in the preservation of the forest and in the continuity of its yield of the timber which enters into practically all classes of construction. In regard to the value of the forest as such, engineers are familiar with the fact that rivers with an even flow have been transformed into torrents in the spring and rivulets in the summer by the destruction of the forests at their sources; the Grand River in Southern Ontario is an example often cited in this respect; they are also familiar with tracts of land that have been transformed into sand deserts which menace the adjacent country, or into rocky wastes, by the clearing of their forest and thin soil protection; this is why the value of the forest as a soil cover is considered of greater importance than as a timber producer. The imagination need not be stretched to conceive that the destruction of the forests of the Great Lakes' water-shed would have a greater effect on the flow of Niagara Falls than several hundred thousand horse-power hydraulic plants, and on the inland navigation system than another Chicago drainage canal. Although it is not proved that forests directly influence climate and rainfall, it is generally admitted that they have a beneficial effect in acting as wind-break, in cooling the air, and in influencing rain-storms. Their action as a regulator of the flow of water is well known."

Speaking in a general way of forestry methods, such as would need to be employed, say in a country like New Ontario, used for investment purposes for producing lumber, the forester will first acquire a knowledge of the property. A compass survey with barometric levels will enable him to draw comprehensive maps showing rivers, creeks, valleys, swamps, hills, etc.; he will also note the nature of the soils, the directions of the prevailing winds, and the amount of rain and snow fall, while his knowledge of trees will enable him to determine the different species, their rate of growth, and the nature of the stand in the different localities. From this knowledge he determines the ages, sizes, amounts of available timber, and the productive capacity of the limit, which will enable him to draw a plan of exploitation. This is where skill and experience are of paramount importance, since the policy adopted will probably be retained for a great number of years, and errors in judgment will be costly. A given forested area can only produce so much timber, and if the amount of cutting is to exceed that of reproduction, the continuous yearly crop principle must be abandoned. This yearly crop will be doubled and trebled, but only after many years of forestry practice, and a gradual increase of expenditure in protection, in removal of weeds, and in thinning of dense stands. Any system will require expenditure, and future remuneration must be well assured before a system be put into practice.

The working plans adopted so far in the privately-owned forests of the United States, have been a compromise between the owner and the forester, and in many cases the forester has had to give up most of his measures conducive to perpetual yield, in order that the immediate cost of lumbering might not be increased beyond a certain point; in these latter cases he aimed specially at reducing the waste and at preventing the producing power from being unnecessarily destroyed. Mr. Gagne looks to "Localized Selection" as the system of forestry most adaptable to Canadian forests. This consists in sub-dividing the area into a certain number of parts forming the operation of one year's cutting, the number of parts determining the time which must

elapse between two successive cuttings of the same area.

Under the head of State Management the author says:

"The importance of the protective properties of the forests being a matter which interests the whole nation, a State control of Protection Forests is essential; and on account of the long time element in natural reproduction, Supply Forests are also best managed by the State. Fortunately most Canadian governments have retained the ownership of the forest land, and sooner or later the areas over which cutting rights have been granted will revert to the Crown. The country is probably not prepared to go the whole length of European practice in the matter of laws and regulations, but many improvements are imperative if the remainder of the Canadian forests are to be saved before they are beyond recovery. The most pressing need is that of more adequate protection from fire, which is yearly devastating hundreds of square miles, and in this the experience of Europe and the United States, as seen above, is most valuable and convincing. If lumbermen cannot be persuaded to protect their own limits it becomes the duty of the Government to regulate their operations and prevent them from at least increasing the danger of fire. In all cases some means of prevention, such as fire lines, more frequent patrol or ranging, and control over settlers' fires are urgent."

DEFECTS IN PAPER MACHINES.

Of late a good many complaints as to defects in paper machines have been heard, and much has been written on the subject. Many have tried to explain the mishaps in question in all possible ways, and to give equally varied advice, but as opinions materially differ I should like, for the advantage of those interested, to contribute some results of my many years' experience as superintendent of several paper mills as to the three principal factors in the question, the wire, the wet parts and the drying parts.

The most sensitive portion of the paper machine is certainly the couch press. If it is not in faultless order the machine resembles a man suffering from heart trouble. I have found defects in the couch press, which had been existing for years and had exercised very unfavorable effects upon the quality and quantity of the paper made. In one mill the copper jacket on the upper couch roll was loose in the centre, and in another on the two sides. These defects were rendered noticeable by the web of paper with normal couching becoming crumpled, the wire at this point always remaining behind, and having to be further stretched, thus getting cracks. Yet at this mill they were deterred by the expense from remedying this great defect.

It likewise frequently happens that the lever motion of the couch press does not work properly owing to carelessness in lubrication. It is a particularly frequent occurrence on the driving side for the bolts to get rusty, so that the lever motion does not follow a very slight pressure, and the wire becomes creased.

Paper mills suffer appreciable injury through defective coverings of suction apparatus. One of the most dangerous coverings is certainly that with perforated boards, which hold the wires firmly on their extensive rubbing surfaces, so that it is not a rare occurrence for the latter to tear off or to get into creases. It has occurred within my experience that the wire came to a stop, and that the lower roll went round empty. After I had fixed the old appliances the wire again ran easily and faultlessly, thus using considerably less power.

Many mistakes are likewise committed in fastening the upper jackets. In one factory the jackets are nailed on to the two ends of the roller on round wooden pulleys; in another they are fastened with iron rings; in a third cords are stitched in. Yet the old method in use thirty years ago is to-day the best: to bind them doubly with twisted hemp

twine, and draw them down firmly. This method has been found to answer best, provided that the jacket has not been unduly stretched.

If the couch press is not in good condition the machine tender may take all possible trouble, and still not attain the desired result, as the effects of the defective couching of a web of paper are not noticeable until the paper reaches the reels, or is rolled. In the same way defects in the wet presses may likewise very injuriously affect production.

If the press rolls do not act properly on each other in the centre the felt will remain at that point, and will become crumpled. If this happens at the sides it is much worse, the felts becoming slack, and having to be stretched, so that the journals of the rollers break, and the felts after a short time crumple. The machine tender, morever, cannot obtain sufficient pressure, the second press being influenced by the other. The ascending felt, on account of its thickness, can no longer exercise a uniform pressure on the web of paper wet in places, and there is no end of the disturbance of changing felts and of turning out seconds. The uneven pressure of the web of paper is in marked evidence when passing through the drying part of the machine, creases arising from the drying, and glazing being by no means rare. Yet all these defects, causing such disturbance in production, can in most mills be easily prevented by the necessary measures being adopted with the first press.

I would like to add something as to the drawing and frequent tearing of the web of paper in passing the last cylinder, usually an upper one. It often happens that owing to the feeding appliances being out of order the cylinder is only half filled with water, and in the oscillating movement produced causes the drawing and tearing of the web of paper. It also happens that the cogs of the driving wheel of the drying cylinder are much worn, this being sufficient to cause the last-named defect in the web. With a worn bearing on the drying cylinder the latter lies deeper on one side, the well-known drying creases resulting, which it is difficult to remove by the readjustment of the paper guide rolls.

These mishaps from my own experience are intended principally as a guide for young paper-makers, and would encourage me in the direction of further communications if my present remarks helped in the recognition and removal of these difficulties.—Translated for the Paper Trade Journal.

AN IMPROVED DOCTOR.

An improved paper machine doctor has been patented in Germany by M. G. Panaitopol, engineer of Bacau, Roumania. In place of the doctor working on the usual rotatory axis the inventor fixes it between a pair of slides parallel to that diameter of the press which coincides with the line of contact. The guides have some milli-metres of lateral play, which permits the doctor to rest by its own weight uniformly the whole length of the press. One advantage claimed for this arrangement is that the obliquity of the doctor is always the same, whatever the manner of using the knife may be. Further an economy of power to the extent of 63.2 per cent. of that usually absorbed by the doctors is said to result from the use of the new method. The doctor can also be cleaned easily while the machine is working because, being lighter, it is more quickly raised for the purpose.

To Pulp Manufacturers.

Young Scotsman, with live connection amongst English and Scottish mills, wants to hear from Canadian Wood Pulp manufacturers who are wishing to build a business in Great Britain. Advertiser has lived some years on the Continent and in U.S.A., and speaks German. Full particulars and references when required. Address

J. M. S,
Pulp & Paper Magazine, Toronto.

Pulpwood

Offers wanted for from one to three thousand cords of spruce and balsam, to be delivered next spring. Correspondence solicited.

W. L. HIME,
160 Dowling Avenue,
Toronto, Canada.

Position Wanted

Superintendent open for Engagement.

A1 on Book, Bond, Blottings and Coating Stock 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc. Address M. R. J. care Pulp and Paper Magazine, Toronto.

Wanted

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MARKETS.

Toronto, October 17th, 1908.

Business in the paper trade seems to be certainly improving, but the movement in this direction is as yet a slow one. Whether it will have resumed its normal proportions by Christmas is still a question, many people believing that the good effects of fine crops will take longer than that in which to reach fruition. Some stiffness has been discernible in paper prices owing to the strikes across the line and the extremely low water in many parts, which has brought a shortage of pulp. News roll is quoted in Toronto at about $2.30 to $2.40 in carload lots; sheet news at $2.75. Ground wood is quoted around $22 at United States mills, and some believe it will advance shortly. Sulphite is dull and quotations only nominal.

British.—According to reports in the World's Paper Trade Review, mechanical pulp continues to sell slowly, but prices are fairly firm. In chemical pulp also there is a slightly better tone. The market for chemicals is steady. Ammonia alkali, 58 per cent., stands at £4 15s., Liverpool; bleaching powder (soft wood), £4 12s. 6d.; caustic soda, 76-77 per cent., £11; soda crystals, £2 17s. 6d.; salt cake, £2 2s. 6d.; recovered sulphur, £5 to £5 5s.

Norwegian Pulp Market.—"Farmand" says that the tendency for mechanical pulp has hardened appreciably, kr. 42 net f. o. b. is now the general quotation for good ordinary brands for delivery over 1909 and 1910. An active demand for prompt is anticipated when the British mills commence filling their stocks for their winter requirements. The market for cellulose has, on the other hand, become demoralized. Some of the new Swedish mills have sold and are offering news quality strong sulphite at £6 15s. to £6 17s. 6d. c. i. f. British ports. These mills, which go in for quantity rather than for quality, have apparently become nervous and wish to clear out their stocks before shipping ports get icebound. Makers of high grade pulp do not at all follow these low sales, but they must obviously tend to depress the market as a whole. A change for the better is not to be expected until the United States again begins to take big quantities of cellulose from Europe.

—The Vera Chemical Company have removed their Western office and works to North Milwaukee. The company's Eastern works and office remain where they are at Stoneham, Mass.

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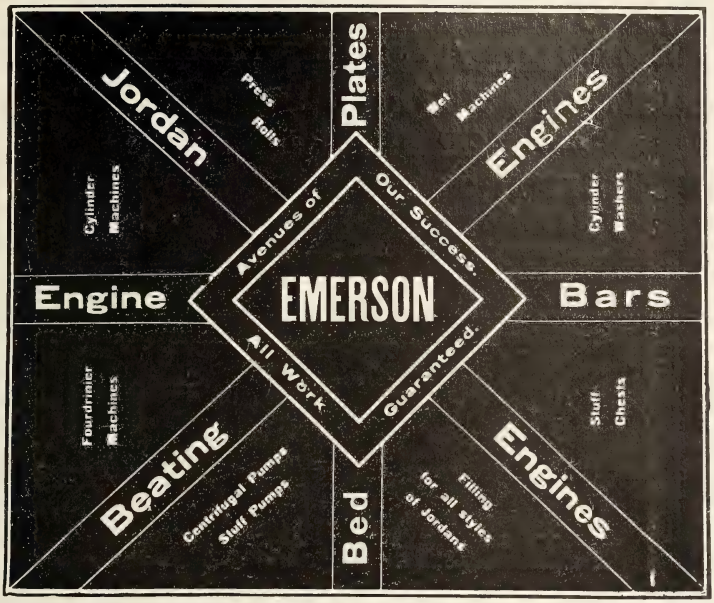

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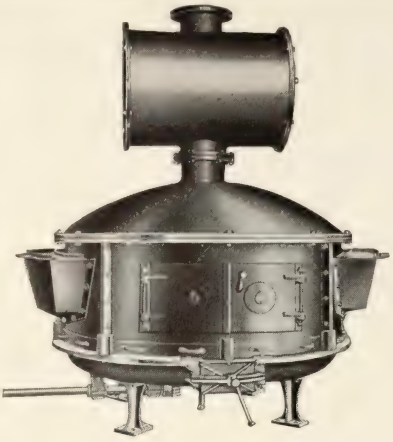

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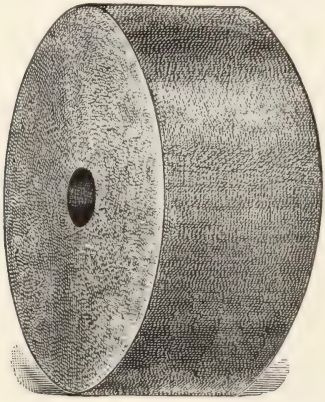

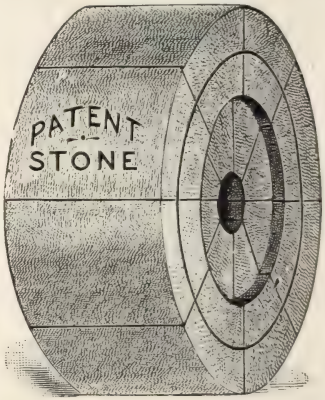

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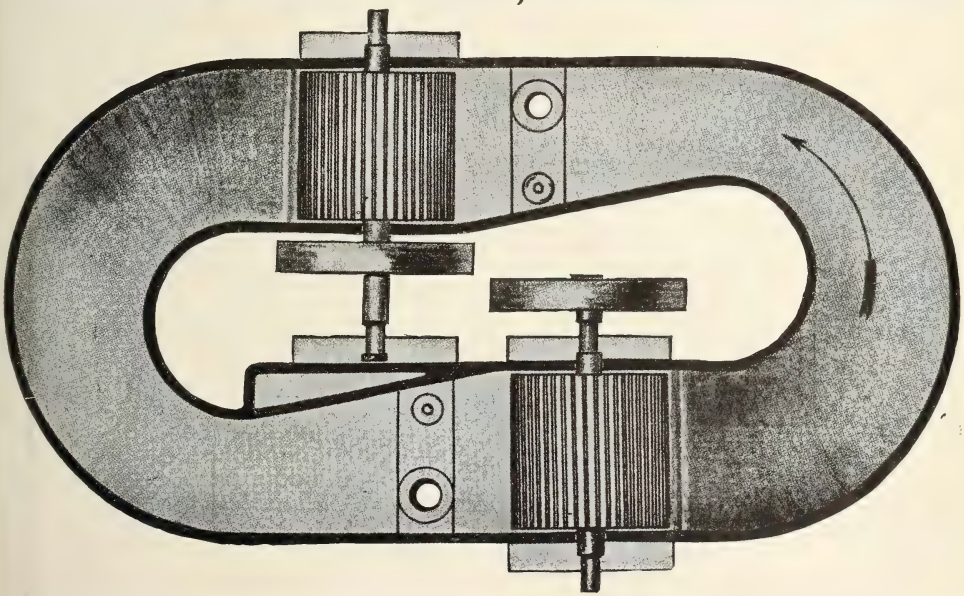

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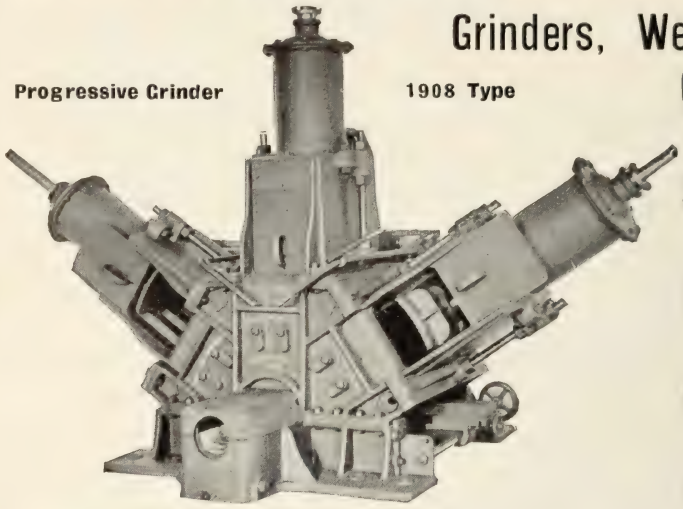

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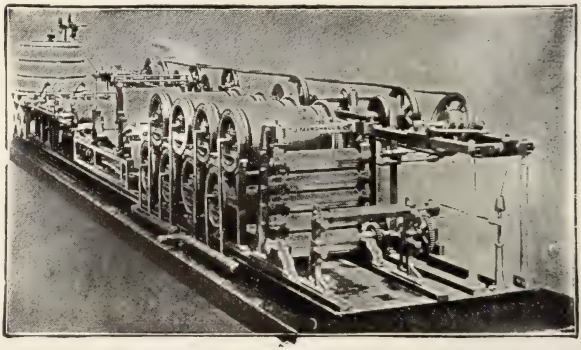

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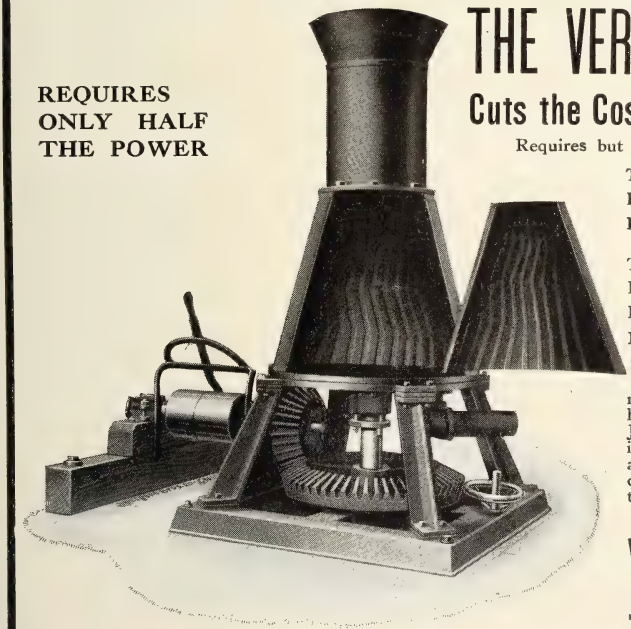

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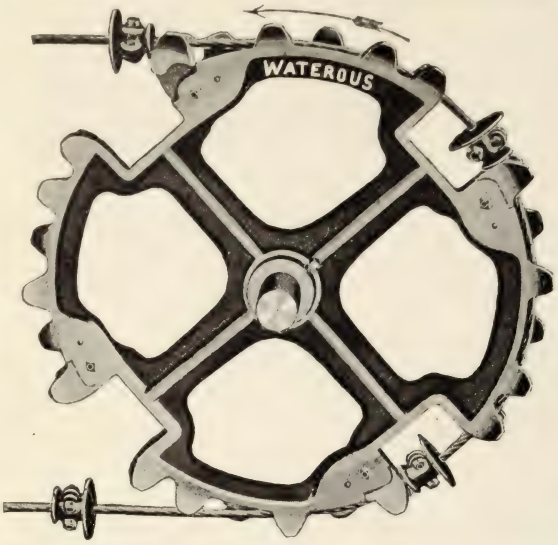

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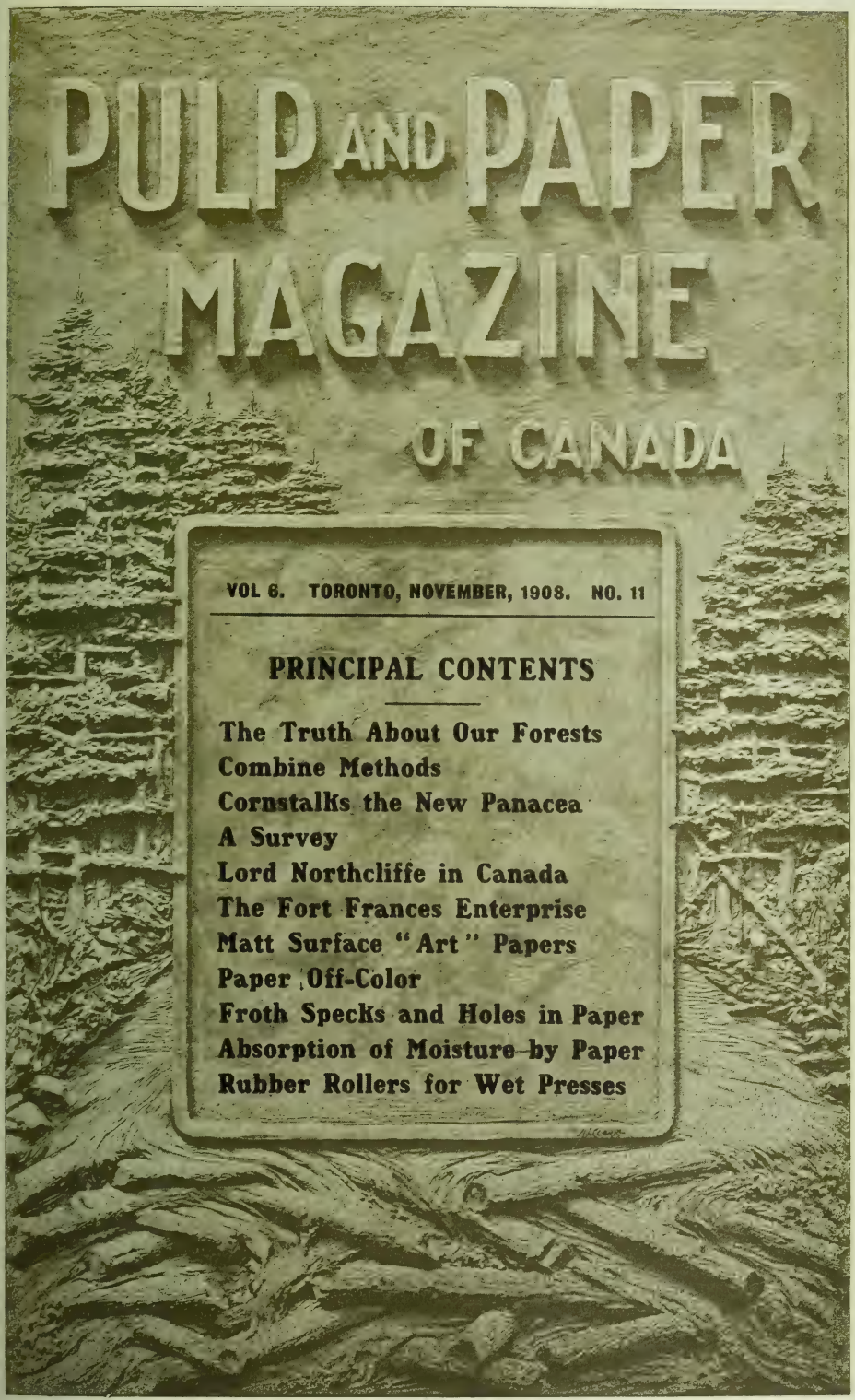

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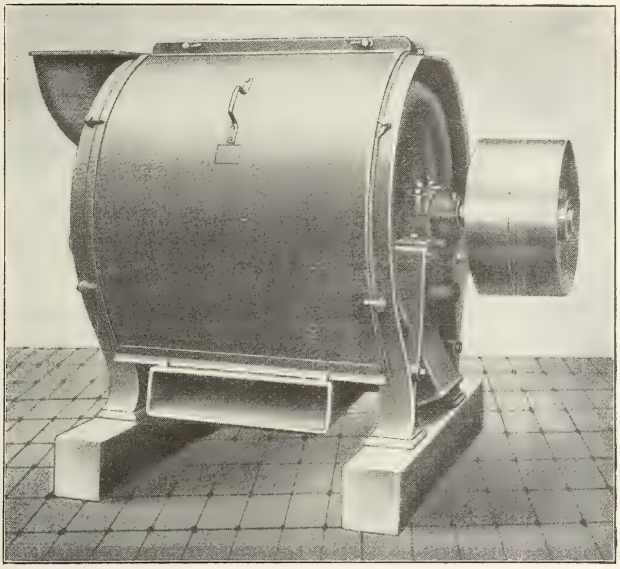

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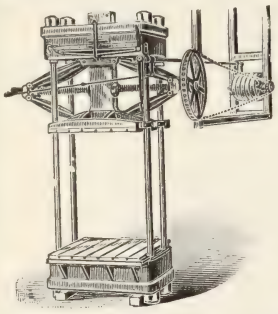

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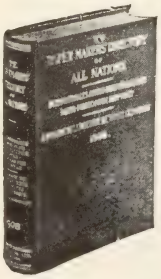

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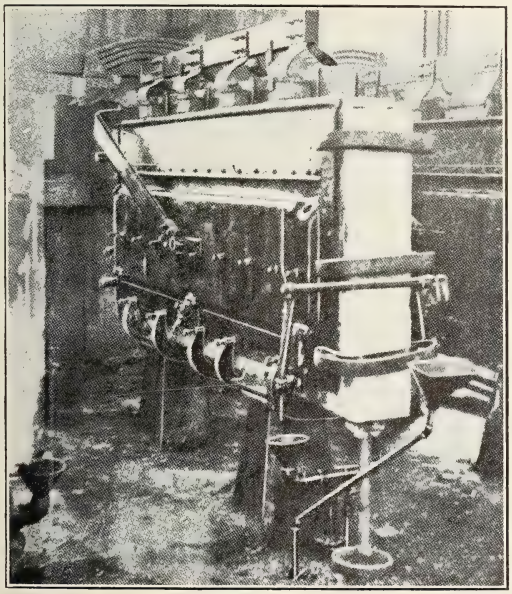

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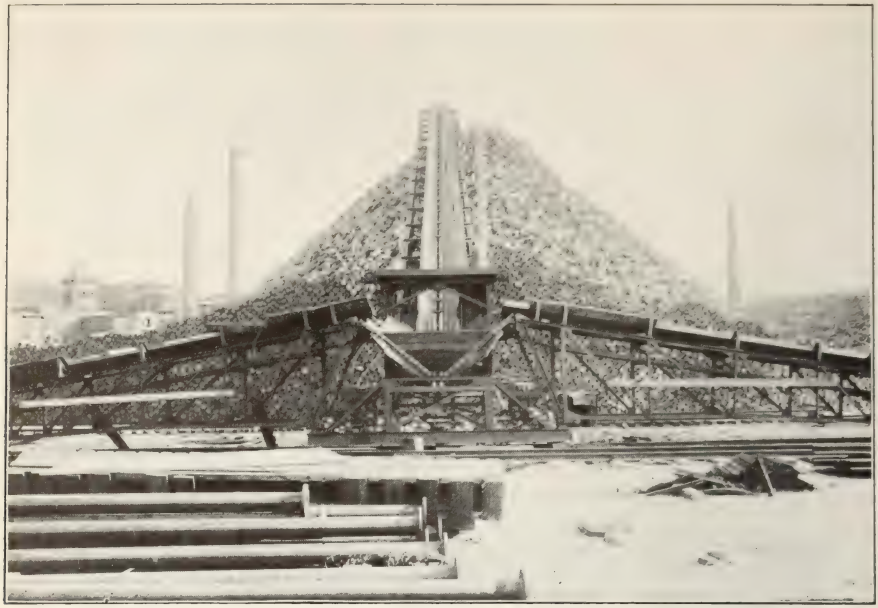

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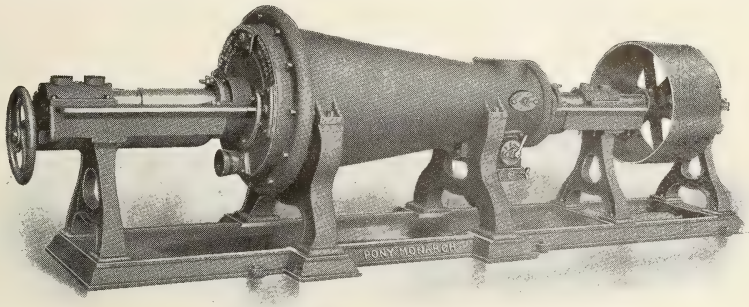

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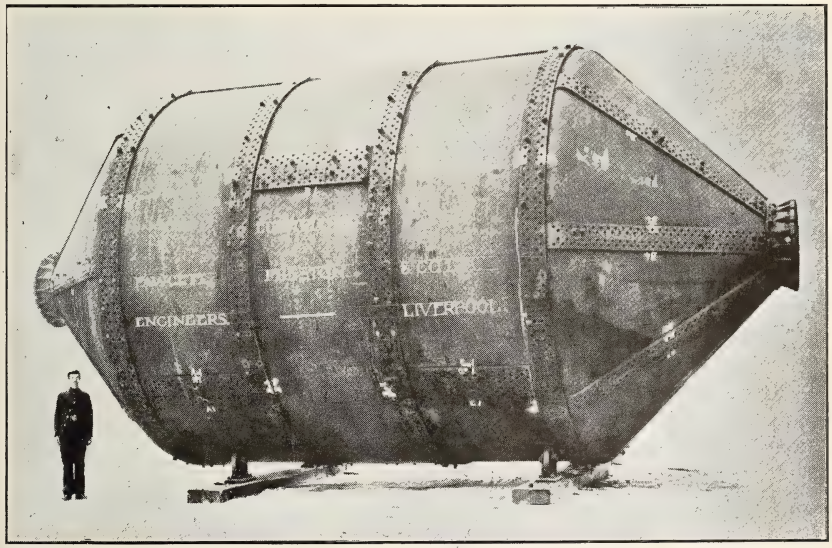

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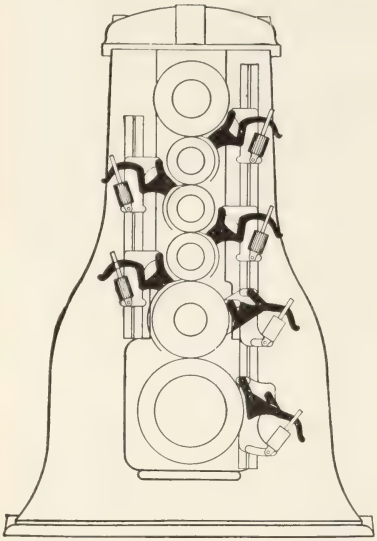

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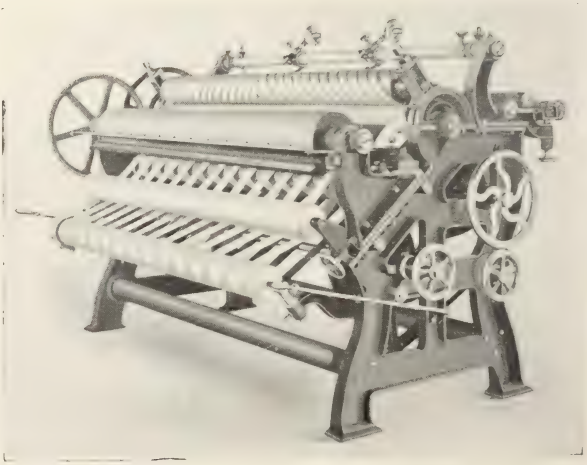

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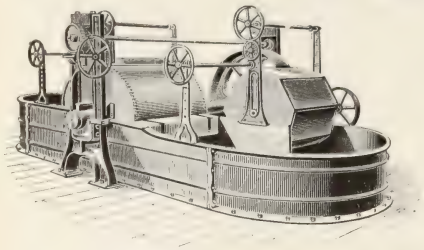

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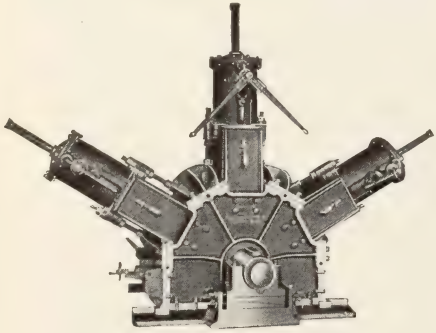

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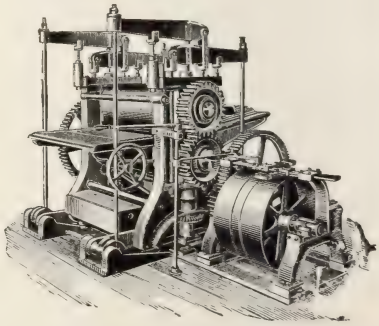

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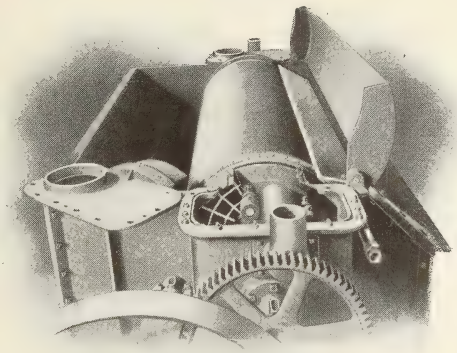

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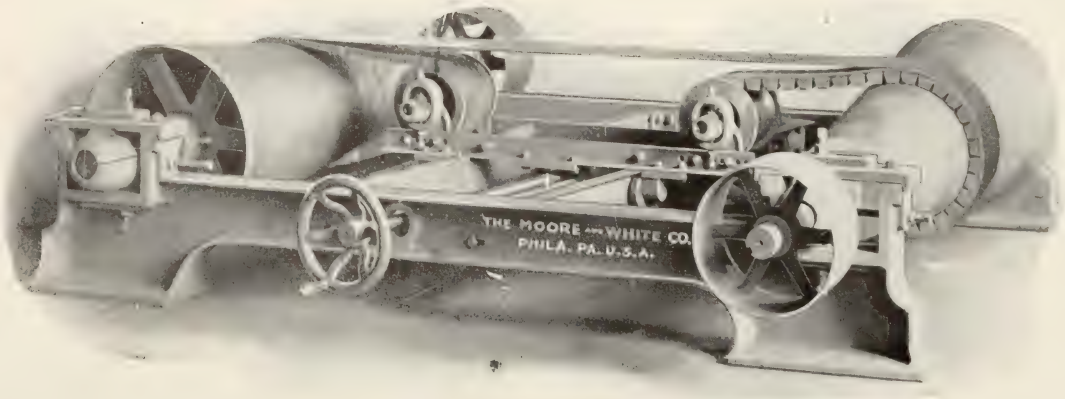

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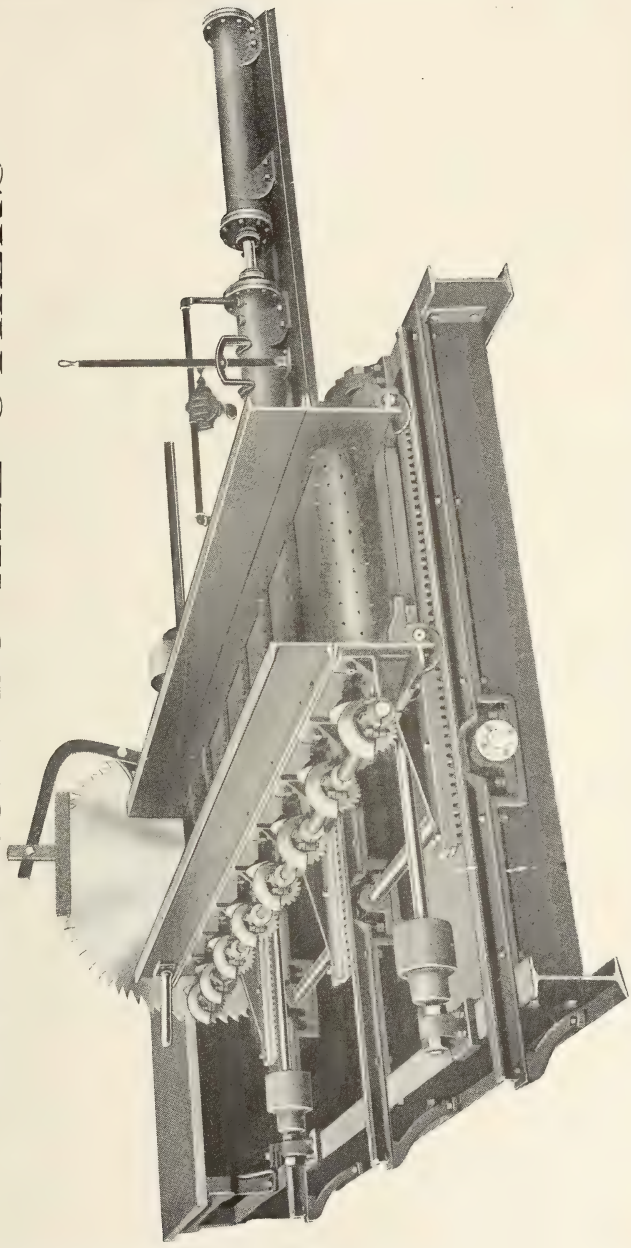

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Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

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THE TRUTH ABOUT OUR FORESTS.

While the truth is not always, nor, perhaps even generally, palatable, it cannot be disputed that to hear the facts about Canada's resources instead of the frequently indulged in rhetoric about inexhaustibleness, and so forth, is really much more profitable for us, and will find us in better shape to make use of them in the end. This is what Prof. B. E. Fernow, Dean of Forestry at Toronto University, attempted to lay before the Canadian Club at its luncheon last week—the real truth as he understood it after careful computation as to the quantity of good, merchantable timber possessed by Canada.

As a consequence of his unbiased attitude of mind, his remarks came as a shock to many of his hearers, imbued with the idea that Canada's forest resources are practically illimitable. The sooner we learn and fully realize the fact that several other alleged "inexhaustible" forest supplies have long since become features of the past, the sooner we will take proper measures for the preservation of what we have.

"Canada is not, as the school geography says, rich in timber," said Dr. Fernow. "Compared with its size or with the timber of the United States it is rather poor, if by timber you mean trees that are thick and that may be cut into logs for lumber or otherwise shaped for use in the arts. Undoubtedly Canada is a woodland country; tree growth of some kind covers, perhaps, more than fifty per cent. of her territory; but if commercially valuable forest growth is considered, land covered with or capable of producing timber of sawmill size, located in sufficient quantity and accessible for commercial exploitation, not ten per cent. will be found to be of that description. The fine British Columbia timber of which the world has heard so much occupies only about 6,000,000 acres. The region on the Pacific coast lies within an area of probably 75,000 square miles, and that on the Atlantic is within an area of 240,000 square miles south of the height of land, or altogether 200,-

000,000 acres. The actual area of commercial saw-timber is not known, but probably does not exceed 50,000,000 acres in British Columbia with a "stand" which may be reasonably estimated at 300,000,000,000 feet. A like amount may possibly still be found in the east. This estimated "stand" of 6,000,000,000,000 feet represents not more than fifteen to twenty years' requirements of coniferous material for the United States. A large amount of pulpwood remains, but much of it is not at all available under present conditions of transportation and development. This is undoubtedly the most valuable portion of the eastern forests, and it is to be hoped that a wiser management than has been had in the disposing of the timber may be inaugurated."

The speaker also made some interesting references to balsam, which he styled the "skim milk" of the woods. At the same time, balsam may be described as intrinsically superior in some respects to spruce for pulp-making, though it has the objection of not floating so well, so, before it can be utilized more largely considerable railroad development will be needed. Another objection which pulp-makers have to the use of balsam consists in alleged greater gumminess, which would tend to clog machinery. As a matter of fact, however, the greater proportion of this excess of gum is lodged in the bark, so that with rossed wood this drawback would not cut much figure.

As to plans for conserving the forest resources, the recently expressed opinion of Dr. Judson Clark, head of the British Columbia Forestry Department, is interesting. He stated that in his opinion the question of reforesting was less important than the careful selection of timber and the allowing of the smaller trees to mature after the good stuff is taken out.

COMBINE METHODS?

The Toronto "Star" draws material for one of its series of onslaughts on combines from the recent action of the wrapping paper men in advancing the price of their product by 15 cents per cwt. Now, we do not at this time propose to go into this individual instance on its own merits or demerits. There may be two opinions as to the wisdom of that step; indeed, there are undoubtedly men well qualified to speak who are of opinion that the reasons given for the advance were scarcely sufficient, though, as a general rule, any given branch of manufacturing industry is prevented from making overreaching attempts to gain extra profits by the pressure of the other units, whose ultimate general interests would be apt to suffer, at least in public estimation, from any appearance of greediness on the part of one of its members. The "Star's" suggestion to abolish the duty on any article, trading in which is carried on by an alleged combine, might easily act with grave injustice towards parties in no sense guilty.

We wish to point out that to the question of combines there are disinctly two sides. As President Roosevelt has said: "There are combines, and combines." There are many instances of industries which have suffered—and suffered foolishly—from the unthinking and unbusinesslike action of a few of their representatives in cutting prices below a living profit, which has brought

about utter demoralization of the whole trade. Such demoralization is good neither for the manufacturers nor for the general public.

A case of this kind occurs to our mind at this moment, and, as it took place in the paper trade, it will be of special interest to our readers. The Menzies Wall Paper Co, whose factory in New Toronto has been successfully operated since the reorganization by the Reg. N. Boxer Co., in the effort to keep and get business, cut prices to such an extent that it got behind to the extent of $210,000, and it was found that they had been selling goods at below their actual cost.

Naturally, this brought about a more or less complete demoralization in the whole wall paper business, and what to do was an exceedingly perplexing problem to everyone else in the trade. One bad effect of such a situation, so far as it concerns the public, is that improvements in the industry, such as in the grade and quality of paper, new designs, better machinery, etc., are almost impossible to make when nobody can foretell what may happen in the near future. Remembering a case like this, is it going too far to say that a combine among those interested in the industry, that is to say, that the coming to an agreement as to what prices, terms of sale, etc., are essential in order to keep the business on a living-profit basis, would be the best possible solution of the difficulty. We have no sympathy with the conduct of those trade associations which exist not only for the purpose of "living and letting live," but in order to squeeze illegitimate rates of profit out of the consumer. But such extortion as this is only turning a good plan into a mischievous one through greed, and does not really affect the character of the original plan itself, which may be a matter of absolute self-preservation.

CORNSTALKS THE NEW PANACEA.

Many have been the proposed substitutes for wood pulp in the making of paper; and many have been the disappointments. The latest object of enthusiasm, particularly among the newspaper publishers, is cornstalks, which are vouched for to a certain limited extent by no less authoritative guides of opinion than chemists of the Washington Bureau of Forestry and the Bureau of Plant Industry. The first practical samples of paper made from cornstalks by means of the new process consist of five grades in five colors. One grade is dark gray, thick and heavy, resembling parchment. There is a lighter grade of the same character, two shades of yellow and one of white. The latter are manufactured from the hard outside part of the cornstalk, and the former from the interior or the pith. The yellow grades have much longer fibre, and are said to resemble paper from cotton rags or linen, soft to the touch and pliable, and appearing to have been made from material of entirely different character from that used in the gray product. In the process of the experiments which resulted so "successfully" the "soda" method was employed, the best treatment for the finer grades of wood pulp paper. The cornstalk pulp can be cooked in from two to two and one-half hours, as against twelve to fourteen hours needed in

treating wood. It is claimed that even at the present primitive stage of experimentation, cornstalk paper can be made almost as cheaply as wood pulp paper, though the latter industry has been developing for the past half century. The belief is freely expressed by the scientists who have been conducting these experiments, that when proper machinery is brought out, and the farmers grow cornstalks in localities where they can be moved cheaply to the mill, the cost will be fully 50 per cent. less than paper now manufactured from wood.

The publishers, who have no surplus of love at present for the pulp and paper manufacturers, hail the new discovery with delight; and, of course, something may come of it, though we "ha'e our doots." We only hope the greatly heralded announcement in Washington will not prove the forerunner of a crop of doubtful stock-jobbing propositions, which often follow in the wake of such "discoveries."

It may be drawn to the attention of those interested that cornstalks as a material for paper are by no means a new proposition, though this particular process for making the pulp may be so. We have seen samples of paper made from cornstalks three or four years ago, and apparently the quality is by no means bad. The sad part of the story, however, is that the cost of making the paper was just about double of what it would have been from wood pulp. So the publishers cannot extract much comfort from that.

Still the report from Washington has much of interest in it, and future announcements—of the denouement or otherwise—will be watched for eagerly. At present the experiments are little removed from the laboratory stage, and there are many questions which will have to be settled. For instance, how will the cornstalks be depithed? How many tons of cornstalks—or acres of cornfield—will be required to make a given quantity of pulp? Why have other processes and other patents been dropped?

A SURVEY.

The general elections in Canada and the United States have resulted in giving another opportunity to the administrations of these two countries to shape, if not to mature, the policies that have to do with the primary resources of the continent. How will they use the opportunity? This is the question thoughtful men are asking. With regard to the forest, for instance, which not only rules the pulp and paper and the wood working industries, but controls the water powers, and to a great extent even the agriculture of the land, what is being done towards a systematic conservation of so vital a source of power and wealth?

We must admit that the public men, the educationists, railway magnates and the heads of industrial establishments in the United States have within the past ten years become alive to the issues that hang upon the forests, and are characteristically in earnest in putting into operation plans for conserving the remnants of the forests and restoring the areas which generations of the past have thoughtlessly devastated. The splendid forestry service developed under the administration of President

Roosevelt, and the personal work done by that great leader of the people in educating public opinion on the supreme importance of conserving the natural resources of the country, especially the forests, will place all future generations under tribute of gratitude to him.

What have we done in Canada to develop a policy of forest conservation? While some of our public men are rubbing their eyes after a long sleep, others are still dreaming that the forests of Canada are simply illimitable, and answer the questionings of investigators with the simple assumption of our fathers that every acre of our northern wilds is an acre of merchantable timber. But as Prof. Fernow, of Toronto University, has told us this month, we know that the hardwood areas of Canada, with the exception of birch, are fast nearing their end, while every species of coniferous tree is limited by climatic conditions to confines far short of the northern land boundaries of our country. Even within these limits of growth we find a vast area of forest land where the trees are too stunted to be of commercial use, and where in the short summers the small amount of annual growth will make reproduction too slow to compete with more southern latitudes. Our forest regions are large, certainly, by comparison with other countries, but we have to confess that the limits immediately accessible are much more restricted than commonly supposed, and fresh limits cannot be made available without heavy outlay of money.

Now, forestry experts are almost unanimous in saying that the State is the only forester that can be depended on to look beyond the desires of the passing generation, and, appreciating the need of wise State administration, it is lamentable to find our provincial authorities so far behind other countries in understanding the supreme value of our forests. In British Columbia the provincial authorities act as if the first duty of the State was to transfer its richest timber domains into the hands of private individuals, who may strip them at their own will, the people meanwhile not seeming to understand that they or their descendants will have to repurchase these domains for purposes of State control, and will have to restore the devastated forests at a painful cost. In Quebec, after a good beginning at setting aside forest reservations, and making an attempt to restrict the depredations of the professional pulp-wood exploiters, an amendment was admitted to the Homestead Act last session which is a confessed surrender to the fake settler. The better elements of the Legislature see the process of spoliation going on, and some of the best portions of the Province so wasted of their forest covering as to ruin the water powers and reduce the land to sterility, but their excuse is the sinister influence in the Legislature of those who "run" certain constituencies not educated on this question. But is not the education of electors in such matters one of the first duties of a statesman? And what, it may be asked, has any provincial administration done in recent years to enlighten the people and to warn them of the consequences of reckless forest destruction in a Province where the forest is the master key of all material wealth? In New Brunswick and Nova Scotia, too, the

illusion of inexhaustible timber wealth is not yet dispelled. Of all the provincial Governments, that of Ontario alone has taken steps towards the reforesting of waste lands, the conservation of Crown forests, and taken a stand against the wholesale alienation of timber lands, and also prohibited the export of raw logs and pulp-wood.

But remembering that during the past summer and autumn timber to the value of from $20,000,000 to $50,000,000 has been destroyed by fires in Canada, it is evident that neither Federal nor Provincial Governments have done what they might to prevent that fearful source of waste—the forest fire.

It was expected during the last session of the Dominion Parliament that the Royal Commission asked for to enquire into the whole forestry question, including the pulp, paper and pulpwood policy, would be granted during the life of Parliament, but the proposition was put aside. One reason given for this delay was that the Government might take it up unhampered after the election. It has now this opportunity, and it is high time so urgent a question was faced.

The problem of forest restoration, conservation and control is the same in Canada as in the United States, differing only in degrees of urgency, but the situation in the industries depending on the forest—such as the pulp, paper and wood-working industries—is varied by the tariffs of the two countries. If the contending interests of the manufacturers in these lines could be reconciled a policy common to the whole continent might be adopted by treaty between the two countries, and Newfoundland might become a party with us in such a forestry league. As the Premier of Canada is honorary president of the Canadian Forestry Association, and the President of the United States is an enthusiastic advocate of forest conservation, there is here a unique opportunity for statesmanship of a high order.

LORD NORTHCLIFFE IN CANADA.

Lord Northcliffe, head of the famous English publishing house of Harmsworths, has just been on a visit of pleasure, business and information to this country and the United States. His interests in the publication business in Great Britain, and in the wherewithal to make the raw material for the same on this side of the water, are so colossal that it is not surprising that this visit has created interest as wide as the continent, particularly among the newspaper and pulp and paper making industries. Apart from his Newfoundland limits, where the Anglo-Newfoundland Development Co will have mills with a capacity of 180 tons of ground wood, 60 tons of sulphite and 120 tons of news print, he has control of over 1,000,000 acres of spruce limits in Nova Scotia, upon which to draw when necessary. It has been supposed by some that it was Lord Northcliffe's intention to enter into competition with the big American paper manufacturers, but we understand this is not the case; and when it is remembered that he publishes a great daily paper with a circulation which rises sometimes to the million and a half mark, besides forty or so weekly and other periodicals, also with large circulations, it will be seen that he does not need to go far to find a market for his pulp and paper output.

A representative of the Pulp and Paper Magazine, being desirous of obtaining the views of such an able and all-round authority as Lord Northcliffe on the kindred industries of newspapers, pulp and paper, called upon him during his visit to Toronto and was accorded an interesting interview.

Lord Northcliffe is fully impressed with the importance of Canada's forestry problem, and clearly sees that the right solution of the same is bound to affect the material interests of the whole Empire. Asked, however as to his views on the question of restricting or prohibiting the export of pulpwood with a view to conserving it for our own uses rather than letting it go out of Canada for the enrichment of the neighboring Republic, he refused to express any opinion, taking the ground that it would be unwise for an outsider to enter so closely into current politics. Strictly speaking, of course, this is by no means a party question, but Lord Northcliffe, who happened to be in Canada at election time, evidently did not desire to have even the appearance of an interferer into Canada's domestic affairs.

On the question of putting into force a policy of mutual preference in the pulp and paper trade of Great Britain and Canada, Lord Northcliffe was not so reticent. In fact he appears to be a strong believer in such a plan. It must be remembered that the British supplies of pulp are at present derived chiefly from Scandinavia, and that the forests of that region are rapidly diminishing in area. While large quantities of Canadian pulpwood have already gone out of this country to build up the paper industry of the United States, the area of Canada's pulp forests, compared with that in other countries is still enormous. If a mutual preference such as we discussed with Lord Northcliffe were adopted, the paper manufacturers of Great Britain would undoubtedly seek to make sure of their supplies of pulp by getting possession of Canadian timber limits, which under the above restriction would not be so open to foreign manufacturers. There is bound to be before long a permanent rise in the price of Scandinavian pulp and paper, and therefore the possession by British manufacturers of a certain and cheap supply from Canadian limits would enable them to recover the ground they have lost in the world's paper markets. In this connection it may be remarked that there has been only one paper mill erected in England during the last ten years.

That opinion in England is ripe for the inauguration of mutual preference is indicated by the fact that at a general meeting of the British Paper Makers' Association, two or three years ago, a resolution was adopted to that effect.

It is interesting to note that Lord Northcliffe, in spite of his proclivities in the direction of large newspapers and many of them, believes with a good many others at the present day, that newspapers will have either to reduce their size or increase their price. A large number of the dailies, both in Canada and the United States, undoubtedly provide quantity at the expense of quality.

We understand that the purchase of timber limits on Vancouver Island, including 35 sections of land off Quatsino Sound, attributed to Lord Northcliffe, was in reality made by Harold Harmsworth, a brother, and not on account of the firm.

PULP AND PAPER NEWS

National Press, Limited, Toronto, capital $40,000, has been incorporated to take over the business of the Toronto Printing Company, print and conduct newspapers and other periodicals, etc.

* * *

The Fayette Lumber Co., Connellsville, Pa., have recently installed a double trolley 5-ton special Northern Crane, electrically operated, designed and built by the Northern Engineering Works, Detroit.

* * *

William R. Hardy, Hamilton manager of the F. W. Bird Co., paper manufacturers, died last month very suddenly of heart trouble. He came from the United States about five years ago to take charge of the local branch of the company's business.

* * *

The Enterprise Printing Company, Ltd., has been incorporated with a capital of $25,000 to take over the Enterprise-Messenger newspaper business in Collingwood, and do a printing, publishing and bookbinding business. G. A. Lunney and W. Ashton Hogg of Collingwood are provisional directors.

* * *

Several prominent citizens of Hull, Que., including representatives of the E. B. Eddy Company, are interested in a scheme to build a railroad 28 miles long from the head of Lake Temiskaming to the Upper Satika River. A new company for this purpose will be organized with a capital of $1,000,000.

* * *

A large quantity of sunken pine in the Rideau Lake section has been secured by the Ogdensburg, N. Y., Soda Pulp Company, and will be raised by means of dredges and taken to Ogdensburg for use in the mills. The pine, though under water for some eight years, is said to be sound, and it is thought some 500,000 cords can be recovered.

* * *

The Jenckes Machinery Company of St. Catharines have been awarded by the courts $1,600 damages against the Canadian Northern Railway for the loss of a carload of tools which they shipped in October 1906, from Kakabeka Falls to St. Catharines. The tools were marked "all rail," but the railway company shipped them from Port Arthur to St. Catharines by the steamship Monarch, which foundered on the way, thus making themselves liable for their non-delivery.

* * *

The Canada Coating Mills, Limited, of Georgetown, Ont., are now putting in a new coating machine with a capacity of three tons per day. This will increase the output of the mills 25 per cent. The mill is now in excellent working order under the superintendence of L E. Fleck. Mr. Fleck was foreman for a number of years in the mills of the Champion Coated Paper Co., of Hamilton, Ohio, and has had experience in other United States mills. Mr. Huestes, the business manager of the Canada Coating Mills, has been elected a member of the Transportation Committee of the Canadian Manufacturers' Association.

* * *

A despatch from Clarke City, Que. of October 23rd, said: The largest cargo of wood pulp ever sent out of Canada is now being loaded on the S. S. Kristiania at Seven Islands, from which port she will sail in a few days for London, England. The cargo will be over five thousand tons, and is the product of the new mill at this place, which has lately been completed, and which is the second largest mill in Canada. The whole product of the mill has been taken by Edward Lloyd, Limited, of London, and arrangements have been made to continue shipments well into the winter months, as the harbor of Seven Islands is easily accessible for at least ten months in the year, and probably for the whole year with some small assistance from an ice-breaker.

NEWS OF THE MILLS

The Dominion Pulp Co., Chatham, is fairly busy just now turning out about 150 tons per week.

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The Miramichi Lumber Co.'s rossing mill at Morrison's Cove, near Chatham, N.B., has shut down for the season.

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The Spanish River Pulp and Paper Company's mills at Espanola are running on about half time, even they having had difficulty owing to low water.

* * *

F. J. D. Barnjum, of the North River Lumber Company, St. Ann's N. S., states that plans are being prepared for the erection of a pulp mill in Cape Breton.

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An employee of the Thorold, Ont., Pulp Mill named Boxer, was awarded $200 damages for injuries incurred in piling pulp-wood on a platform which collapsed.

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Chas. F. Mansell, sales agent for the Toronto Paper Co., slipped on the Union Station platform at Toronto and seriously injured his leg. The patient is recovering slowly.

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W. E. Williams, president of the Bella Coola, B.C., Pulp Mills Company, is busy looking after the installation of machinery at the new mills which are making satisfactory progress.

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The Lincoln Paper Mills have placed orders with English firms for machinery for the new mill which it is equipping at the old Lybster cotton mill at Merritton. A sandpaper plant is to be installed.

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We hear that the Foley Brothers of St. Catharines are interested in a project to build a pulp mill at Bancroft, Ont., where there is a good water-power and an abundance of wood-pulp.

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Will Curry, a workman in the Dominion Pulp Company's mill at Chatham, N.B., had his hand badly lacerated by being caught under a knife and three arteries were severed.

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J. R. Booth, Ottawa, has recently purchased from the Black-Clawson Company, Hamilton, Ohio, a 124-inch board machine. It will have six cylinders, three presses and sixty-four driers.

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The Thompson & Norris Company, manufacturers of corrugated paper, have started work on their big factory at the Centre, Niagara Falls, Ont. The factory will be three storeys high, with basement.

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The Canada Coating Mills, Ltd., Georgetown, Ont., report that their mill has been satisfactorily busy on orders. They recently installed, however, a new machine, thus increasing their capacity.

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The Miramichi Pulp and Paper Co., Chatham, N.B., has a crew of men at work getting the mill into shape for resuming the making of sulphite pulp. It is hoped to have everything running full blast again by early next month.

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A dispatch from Watertown, N.Y., states that the Bagley & Sewall Company is rushing forward the large order recently booked for the Harmsworths, of London, to go to Newfoundland. Thirty-one cars were loaded and dispatched recently to New York, where transfer is made to steamship for delivery at Louisburg, Nfld.

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Andrew Anderson, whose present address is at Winnipeg, was in Toronto last month and paid the Pulp and Paper Magazine a very pleasant visit. Mr. Anderson is a big man, with big ideas, and we expect to see large enterprises result from his energetic handling. He expects to have plans for the new pulp mill near Kenora, Ont., for which all

the necessary capital has already been obtained, fully prepared shortly.

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A despatch from Quebec states that the Government has decided to expropriate the property recently acquired by the Bank of Montreal in forced sale of Carrier, Laine & Co., of Levis, including wharves, machine shops, etc. Value of the property is estimated at $500,000. M. Kennedy has been named by the Government as their arbitrator, and David Rattray has been nominated by the Bank of Montreal. The firm were manufacturers of pulp machinery, which branch has been closed out.

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The Cornwall Paper Manufacturing Company, Ltd., mill at Mille Roches, Ont., is still being operated under the superintendence of the Trusts and Guarantee Company, Toronto, and the business in hand is quite satisfactory, the daily output being in the neighborhood of ten tons. James L. McNichol is still acting as superintendent. On the 19th inst. a meeting is to be held to consider offers for the purchase of the plant, previous offers not having been satisfactory and the appointments having been enlarged.

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It will hardly surprise our readers to hear that the British Columbia Wood Pulp and Paper Company is beginning to doubt the advisability of adopting the idea suggested by J. C. W. Stanley, for producing gas as a by-product in the manufacture of wood pulp at Port Mellon, B.C. The directors appear to think—and without doubt wisely—that it will be better to push forward the manufacture of pulp and paper, leaving by-products for later consideration. We understand Mr. Stanley, in conjunction with G. Kolts, who was one of the agents for the promoters of the British Columbia company, has now acquired a mill in California, though whether he will retire from connection with the former mill is not stated. The buildings at Port Mellon are being pushed forward as rapidly as possible, but it is doubtful whether they will be ready before winter.

President Carey of the International Brotherhood of Paper Makers of America, recently made a visit to Quebec Province, his object being, it is understood, to try and put a stop to the shipping to the United States by Canadian mills, which was one cause of the indifferent success of the paper strikers in the neighboring States. By last reports, the employees of the Laurentide Paper Company at Grand Mere were still out on sympathetic strike, and this was probably the only result of Mr. Carey's trip. Neither the men nor the company seem disposed to accede to the others' demands.

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The Laurentide Paper Company has brought action against the Canadian Northern Quebec Railway for damages done their property at Grand Mere. The claim is for $22,140. In 1897, the railway company built a bridge across the St. Maurice River near Grand Mere. Part of the bridge was since destroyed, and was rebuilt in 1904. Instead, however, of leaving the river clear from pier to pier, as was the case when the bridge was first built, it is claimed that the trestle work was extended across the river. The effect was that last spring the river was dammed, and the water was banked as far back as the Paper Company's mills, resulting in the mills being shut down for several weeks last spring.

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The new pulp mill promoted by James Beveridge at Millerton, on the Miramichi, a few miles above Newcastle, N. B., is nearing completion and will probably be in operation before the end of the year. Mr. Beveridge, who has pushed this enterprise with great energy, has obtained a provincial charter for the business under the name of the New Brunswick Pulp and Paper Co. The capital is $200,000 and the names of the incorporators are: Geo. W. Volckman, James Beveridge, John D. Volckman, F. M. Beveridge and A. H. Hannington. We understand that the capacity of the mill will be 50 tons

of paper per week, and that Kraft brown papers will be the chief product of the mill.

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A report has been circulating in the trade this month that John R. Booth of Ottawa had taken over the Imperial Paper Mills at Sturgeon Falls. The report has no foundation other than this, that Mr. Booth is taking the output of these mills in mechanical pulp to supply his own mills at Ottawa since low water has prevented him from grinding a sufficient supply for his paper mills. Low water is also a difficulty at Sturgeon Falls, as with most other mills. The sulphite branch of the Imperial Mills is closed, but the mill is selling a small quantity of news as well as shipping pulp to the Booth mills. The chairman of the bondholders visited the mills last August, and in default of satisfactory offers for the mills and timber limits it was agreed to carry on operations under E. R. C. Clarkson, assignee, of Toronto, as receiver. The timber limits, which form the most valuable portion of the assets of this company comprise an area of 2,750 square miles.

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In a report on the trade of Stockholm, Mr. Villiers, British Consul, refers to the great development of the wood pulp industry in Sweden. As showing the progress made it is mentioned that the export of wood pulp in 1872 was 1,000,000 kroner (£55,500) increasing to 45,206,148 kroner (£2,511,543) in 1906. It is stated that the production in Sweden of wood pulp factories is 57,298,238 kroner (£3,183,224). The exports in 1907 of mechanical wood pulp were 173,512 tons, as against 137,350 tons in 1906; the exports of chemical wood pulp were 357,004 tons, as against 276,950 tons. The reports covering the vice consular districts also report a very satisfactory trade during 1907, the growth in exports being attributed to the many new establishments putting their product on the market. Mr. Villiers regards the wood pulp trade as one of Sweden's most important and most satisfactory industries, remarking that in spite of the steady addition of new mills to those already in operation the supply without difficulty keeps pace with the demand. The favorable conditions of 1907 have, however, been followed by considerable depression.

—The Northern Engineering Works, crane builders, Detroit, have changed the location of their Chicago branch office from 405 Monadnock Block to 539 Monadnock Block, with Mr. B. C. Wolcott in charge as formerly.

—The papermakers' strike against the International Paper Company, declared on August 1, has been officially declared off by the union, under the same conditions as provided for in the agreement of September 24, between President Carey of the union and the International, which was not ratified by the locals. The International Paper Company will take the men back as fast as needed, but they must apply as individuals, and the mills will be run as "open." The men, it will be remembered, struck against a reduction of ten per cent. The September agreement is a compromise, calling for a reduction of five per cent.

—The annual statement of the International Paper Company for the fiscal year ended June 30, 1908, presented at the annual meeting in Corinth, N.Y., last week, shows that the gross income was $20,716,304, while expenses amounted to $17,878,134, or $1,121,882 less than for the previous year. The net income was $1,635,918, compared with $1,623,617 for the previous year. The earnings in excess of all expenditure, including dividends, amounted to $515,583, making the surplus account on June 30 $7,381,083, as compared with $6,865,500 for the previous fiscal year. The old board of directors was re-elected.

HOLLANDER CONSTRUCTION.

So many accounts of various builds of hollanders have appeared in technical literature that it will no doubt be useful to give some hints on the subject. The variety of construction is considerable, and this bears witness to a constant striving to improve the machine for present purposes. As is usual with novelties of all kinds, each new alteration in the construction of these machines is claimed to effect more than it can really perform. These unwarranted claims are most unfortunate, as once a paper-maker has been disappointed with a new machine, his natural conservatism is powerfully reinforced, and great discouragement is put in the way of inventors, so that even excellent ideas are burked out at the outset.

Seeing that the hollander is one of the most important parts of the paper-maker's plant. the present types should not be altered without excellent reason, nor until full proof has been forthcoming that the proposed alteration is a real improvement. It unfortunately happens that alterations in the construction of a hollander which introduce real advantages in some respects entail disadvantages in others which discount the advantages entirely, or so nearly so as to make the invention worthless. When we consider that a hollander must be able to turn out pulp at any speed from any kind of raw material, it is easy to see how improvements in one way may be defects in another.

The first point to be considered is that the hollander must be dimensioned according to the daily output of the paper mill, i.e., according to the size of the rest of the machinery. Another is that the flow into the hollander must be so regulated that no stuff escapes the knives to give rise to lumps and knots in the after stages of the manufacture. The arrangement of the knives on the beater-roll, and that of the fixed knives below it, must be suitable to the particular fibre being worked up. The cover of the machine must be of suitable shape as well as suitable size, and the roll must be at such a distance from the breasting that the stuff travels under it at the proper rate without any extra mechanism to impel it. One alteration from the old type of hollander which has had many advocates is to set the knives slanting on the beater-roll. This seems, however, to be quite a mistake. It is true that they then break up the stuff better, but at the same time they direct the pulp to one side, so that it does not leave the hollander uniformly. This is one of the best instances that could be adduced of the statement made above that an improvement of the hollander in one direction usually involves detriment of its efficiency in another. Another point in which experts differ is in the clearance between the knives on the beater-roll and the stationary knives, and it is to be feared that there is a tendency at present to make this too small. This makes the knives wear faster and checks the flow of stuff without, however, saving time as regards fineness of pulp, in anything like a corresponding proportion. Another new idea is to have the knives bent instead of straight. Although such knives beat well, they will be found in practice to tend to produce lumps and knots. The thickness of the knives should be from 6 to 9 mm. for the beater-roll, and from 4 to 5 mm. for the breasting, making the breast knives, which first meet the pulp, rather thicker than the others. The distance between the knives depends, of course, upon whether coarse or greasy pulp has to be made. What has been said about oblique setting of the knives on the beater-roll applies also to the knives on the breasting. It must not be forgotten that the object of the hollander is rather to grind than to cut the fibres. It may be said, in conclusion, that what little improvement has been made of late years in the hollander has been in the direction of saving driving power, and not so much of improving either the rate of working or the quality of the pulp produced. At he same time, this

advantage is in many cases imaginary. It is extremely difficult to estimate the power absorbed by a hollander, and differences in the measurements of the power are far more likely to be due to differences in the work done and other circumstances than to the construction of the machine.

The smaller a hollander is, the more firmly it must be fastened to the floor. If the hollander is large its own weight helps to fix it, to say nothing of the weight of the contents. Small hollanders, i.e., such as take two cwt. or less of dry stuff, are fixed on vaulted brickwork, over which a concrete floor is laid. If a new shop has been built, the hollander is supported over the brickwork on iron supports in such a way as to leave about two inches clear under it. This space is then filled with the concrete. and a level floor is made. The concrete is made with river gravel sifted from the sand, and in pieces varying in size from a hazel-nut to a walnut, and should consist of six parts of aggregate to one of cement. Too much water is to be avoided, and the sifting out of the sand must be most thoroughly done. When the space below the hollander has been completely rammed full of cement, a loam dam is made round the cast-iron trough of the hollander, and at a short distance from it. The annular space so formed is then filled with a rather liquid concrete made from two parts of sand and one part of cement. This soaks under the hollander, and fills every crevice and cavity in the gravel concrete, thus binding it into one solid mass. The dam is finally removed and the rest of the flooring is put in in any convenient manner. If the work is carefully executed, the use of bolts will rarely be required.

BRITISH PAPER TRADE.

The foreign business of the United Kingdom continues to hold up well despite adverse trade conditions, says the "World's Paper Trade Review."

The British official record of last month's trade shows, as usual, a large increase in the imports of packing and wrapping papers, and a considerable decrease in those of writings and printings, the net result being an increase in value of a little over £18,000. On the whole, this year's import trade in paper, so far as it has gone, does not allow very much room for grumbling on the part of the home manufacturer. There has been, it is true, an aggregate increase of 83,000 tons in the imports of wrappings and packings, worth, say, 17s. per cwt. all round, but, on the other hand, there has been a total decrease of more than 54,000 tons in the imports of foreign writing and printing papers, valued at rather less than 16s. per cwt. Adding some 4,000 tons of boards, etc., the total is about 33,000 tons on the wrong side, all accumulated in the course of eight months. This is bad enough, certainly, but still it might have been much worse. For instance, the increase in packings for August is smaller than for any previous month of this year, whereas the decrease in the imports of other kinds is larger than that recorded for either June or February, and very little below those for March and May. There is food for thought in the fact that the foreigner has, for a long time past, found it not so much worth his while as formerly to ship up cheap writing and printing papers (less than 5 per cent. of the decrease this year is due to web news), at, say, 1.7d. per pound, and has pinned his faith instead to fairly good class wrappings and packings, worth 1.9d. per pound. This seems to suggest that British competition in the former sorts has reached a point at which the foreigner is beaten not merely to a standstill but is actually forced to retreat. He, however, returns with another and apparently more profitable line, and it is thus "up to" the British paper maker to beat him at this also. It ought not to be very difficult, seeing that probably two-thirds of the mills in this country turn out wrapping and packing papers

of one sort or another. It must be admitted, nevertheless, that a considerable proportion of them are small establishments in out-of-the-way districts, not a few being also handicapped with out-of-date plant. Still, it is very evident what the nature of the foreign competition is, and unless the British paper manufacturer is more apathetic than we give him credit for he will bestir himself to supply the British user of wrappings, etc., with British makes, instead of letting him draw so large a part of his supplies from abroad.

Speaking generally, there is not much change in the exports of British paper, etc. The drop in total value for the eight months ending with August is only a fraction of 1 per cent., although so far as last month is concerned there is a decrease of 12½ per cent. as compared with the same month of 1907. But even when this has been taken into account the total is still 2½ per cent. higher than that of 1906, so that after all there is a grain of comfort in the business. The backbone of the British export paper trade is made up of the shipment of writings, printings and envelopes (we retain the old classification for convenience of comparison on this occasion), and in this branch last month's figures exhibit a falling off to the extent of about 17 per cent. Nearly half of this is traceable to a lessened demand from France and other foreign countries (except U.S.A.), the balance being chiefly due to smaller shipments to British India. But when we come to deal with the eight months ended August 31st, the decrease is only about 3 per cent. During the same period, the average weekly export of writing and printing papers is of the value of about £30,000, the proportions due to the two sorts being as 3 to 7 respectively. Only one-third is supplied to foreign countries, all the remainder being absorbed by British possessions, more than a third of it by Australia. Having regard to its comparatively trifling European population, it is surprising that over a fourth should be shipped to British India and Ceylon, and the fact that two-thirds of this proportion is due to the call for printing paper speaks well for the power of the Indian press and the intelligence of the vast native population it mainly caters for. Seeing that the shipments to foreign countries, other than the U.S.A., have decreased to the tune of 10 per cent. during the eight months in question, it is obvious that there must have been an increase in some other direction, for the total to so closely approximate to that of the corresponding period of last year. Accordingly we find an improved demand from Australia to the extent of 13 per cent. In fact, the Commonwealth and New Zealand purchase between them a third of the total quantity of writings and printings exported from this country. South Africa's share, averaging 7½ per cent, being trifling in comparison.

—There is an agitation going on in Sweden for the suppression of such sulphate mills, as were not working previous to Jan. 1st of this year. Objection is made on account of their smell and other obnoxious properties. Widespread interest is shown in the matter, because of the important place this manufacture occupies in the country's prosperity.

—It is understood that Aubrey White, Deputy Minister of Lands, Forests and Mines for Ontario, is authority for the statement that the forest fires which have raged in that province have done very little harm to valuable timber, having been confined mostly to sections from which the best timber had been taken. This is satisfactory so far as it goes—but that is not very far. What about the small stuff which in time would become big stuff? And what about the soil burnt over? Fertility is worth a great deal, and much of that is destroyed by these unfortunate burnings. We cannot afford for the idea to grow that any fire is a matter of small importance.

PAPER OFF-COLOR.

The subject of the discoloration of white papers is one of much technical interest, and investigators do not care to lay down hard and fast rules regarding it. Theories and conjectures crop up in number, and although one may be able to specify definitely the principal cause of any one particular paper getting discolored, there are invariably many factors to be considered.

We know that ultramarine blue is very stable to light and a moderate amount of dry heat, but we can seem to prove why it is that a paper colored with ultramarine tends to "go back" in a hot, damp atmosphere. If we take some ultramarine and mix it with china clay till the paste is slightly blue, and add a few drops of alum and gently warm it, the faint, disagreeable smell of sulphuretted hydrogen will be given off, accompanied by the going of the color. Invariably an ultramarine paper is slightly acid from alum, therefore we can assume that the alum in the paper—inactive in the dry state—when it is moistened and warmed by the damp, hot atmosphere becomes active and attacks the ultramarine with the same result known to take place by experiment with the blue and an acid liquid in direct contact.

It is interesting to observe the effect of sunlight on white papers; most of them, probably all of them, if exposed to direct light by hanging them in a skylight or against a window pane will soon become whiter and clearer in the look through. If we take a sheet of high-class paper made entirely of rag and tinted with smalts blue, tear it in two pieces, subject one half to direct daylight, and put the other piece where it is not directly exposed, in two or three days' time on comparing the two halves it will be seen that the exposed piece is now very slightly more translucent—it has a clearer look through. We must consider this a phase of oxidation, but the slight change in the appearance of a high-class paper after treating it in the way described need not be looked upon as the beginning of the end. It may mean that in the very best paper there are infinitesimally small micrisms of opaque matter readily oxidizable, and white as the stuff has been bleached, it has not been so complete that nothing is left for sunlight to work upon. As far as the color goes—in this case smalts blue, which is ground glass made of silicate of cobalt—it is very stable indeed to light, acid, and heat, therefore the change is not due to alteration in the color itself.

If we take a colored paper that has been dyed with an aniline derivative and expose it to light, we know that in a comparatively short time the color will fade and eventually all but disappear; so if a white paper containing aniline die is treated in the same way it can be assumed that when the light is bleaching impurities it also bleaches out the dye, and the change in look through is more marked than if no color had been added to brighten the paper.

We also know that by comparison with a duller paper a brighter one will go back to a greater extent. One refers to a paper blued to brightness with an aniline die exposed to light; the result is that the color goes, and the look-through is clearer and the look-on eventually becomes less bright.

A paper, especially one made from chemical wood and esparto, not only contains bleaching residues which under certain conditions attack the fibre, but the stuff itself is not thoroughly bleached—lignous matter in the wood and pectous matter in grass is left in. Here we have two factors for consideration—the further bleaching of the stuff by light, and disintegration by the residues. Where the half-stuff has been insufficiently bleached the paper has a yellowish appearance and this becomes accentuated and in time turns to a yellow brown.

How rarely one comes across an elderly book or periodical, say one a hundred years old, where the paper is

not in a fairly good state of preservation It may have suffered from "hydrolytis" nearly all its life, but death from senile decay is yet far off—it is brown at the edges, and musty looking brown spots and patches are freely sprinkled about, but the fibre structure is there, it hangs well together and still supports and renders readable the faded print it became associated with a century ago.—Paper Makers' Journal.

MATT SURFACE "ART" PAPERS.

Matt art papers are coated papers like the ordinary "art" papers, but the coating layer is not so thick, and the deleterious hot supercalendering is omitted. The new papers are obtainable both white and yellow toned; the white is not so dazzlingly pure white as in the ordinary coated papers, but is slightly subdued; in the case of the toned papers the tint is evidently applied after coating., as the colored surface when scratched with a knife shows the white coating below. With these matt papers, in combination with the matt typographic inks, new artistic effects can be produced, and the result, both from a technical and artistic point of view, is of the nature of a permanent advance and not a passing fashion. The porcelain surface and the brilliant varnish like inks of the old art illustrations are injurious to the eyes and an abomination to the artist. The matt illustrations, by the absence of all obtrusiveness, are comparable with copperplate work. Very fine effects are obtained by mixing three parts of matt double toned sepia ink with one part of ordinary black illustration ink; a still richer depth in the shadows is obtained with matt green-black ink. The printing requires a certain amount of practice in order to obtain the best results, and the firm of Kastner & Callwey, in Munich, have studied the process to perfection. The matt surface papers certainly require heavier pressure in the printing than the burnished papers, because the surface is rougher, and for the same reason they consume rather more ink, being more absorbent than papers which have been crushed together by heavy calendering. But these qualities are no drawbacks when the results are considered, but rather contribute to the effect, which resembles that obtained from etched plates; the paper takes up all the ink from the block at every impression uniformly. These matt papers with double toned matt inks give results with a single impression such as otherwise can only be produced with two impressions by the duplex autotype process.

CELLULOSE BOILERS.

The question as to whether horizontal or vertical boilers are better is not yet settled. The same uncertainty prevails as regards a choice between immovable and rotating boilers. It seems to be pretty generally admitted that boilers rotating on a horizontal axle labor under the disadvantage that the wood is never entirely immersed in the lye, with the result that parts of the pulp acquire a dark brown color which cannot be got rid of and often produces dark stains in the finished paper. Even when it happens that the dark color is uniformly distributed through the pulp, which is rarely the case, it is obvious that it prevents the pulp from use except in the preparation of second rate papers. This dark color was observed long before its cause was known, and it used to be attributed to careless trimming of the wood, so that scraps of bark and knots and other dark colored parts of the trunk were ground up with the white wood. Once, however, the wood has been thoroughly soaked, the action of the horizontal boiler is not injurious and the soaking is easily effected in a short time by admitting steam to the vacant part of the boiler. Once all the wood has sunk the rotation can be begun and carried on with impunity. The difficulty does not

occur with vertical boilers or with stationary horizontal boilers, because once the proper amounts of lye and wood have been put in there is no fear of the wood showing above the surface of the liquid.

FROTH SPECKS AND HOLES IN PAPER.

Dealing with the above trouble, a writer in the Wochenblatt fur Papierfabrikation states that the specks of froth are mostly met with in strongly sized papers and warm stuff. The best means of subduing froth is the arrangement of water sprays on the sand tables and particularly above the sluices of the machine. The latter sprays not only subdue the froth, but also keep the sluices clean, so that no particles of stuff can catch on them and collect to form patches which break away and spoil the paper. Worse than froth specks is the presence of small round holes in the paper, caused by the bursting of air bubbles in the sheet as it passes over the suction boxes. Frequently in such cases the apron is the cause of the trouble; if the apron be of poor material it may stretch when the machine is running, and may thus be caused to partake of the vibrating motion of the wire; when this occurs small bubbles of air are forced into the pulp and burst when the paper arrives at the suction boxes. Another cause of holes in the paper is the stoppage of one of the register rolls supporting the wire. If the bearing of one of these rolls gets rusted up and the roll stops, a flat place is soon worn away on the roll. In order to bring the roll again into motion the machine man may raise it up a little so that it is in closer contact with the wire. Then, as soon as the roll begins to rotate, the flat worn surface strikes against the wire with a jerky motion, and air bubbles are driven into the paper. In this case the bubbles differ from those caused by the apron, in that they are disposed in straight lines. A similar fault may occur if the register rolls are not true. The most dangerous place for untrue rolls is under the apron and in the neighborhood of the sluices.

ABSORPTION OF MOISTURE BY PAPER.

Experiments have been made recently on the absorption of moisture by various papers. Certain papers, e.g., cartridge case papers, electric wire insulating papers and papers used for wrapping snuff are required to resist moisture in a special degree. The absorption of moisture by paper may be considered under two heads: absorption from a moist atmosphere and absorption when brought into direct contact with water as a liquid. The writer has tested a series of paper in both connections.

In order to test the absorption from a humid atmosphere weighed sheets of paper were suspended in a chamber, the air of which was maintained at a temperature of 68° Fahr. and of a degree of humidity equal to 85 to 90 per cent. of the saturation humidity. This corresponds approximately with the moisture in the atmosphere on a very wet, muggy day in summer. The sheets were kept in this chamber, and weighed at intervals until they no longer increased in weight; this took about three days. The writer found that the hardness of the sizing had no influence in preventing the absorption of moisture from a humid atmosphere. The absorption depends mainly on the degree of beating of the pulp and to a minor extent on the nature of the fibre and the thickness of the paper. All papers absorb moisture from the atmosphere, but those which are beaten very "wet" absorb considerably more than those which are beaten very "free." For instance, under the conditions described above, an imitation parchment paper absorbed the most, viz., 15 per cent. of moisture, while a wood pulp tissue paper, very soft sized, absorbed the least, viz., 9 per cent. Ordinary news paper also absorbed very

little, viz., 0.8 per cent. A series of ten cartridge case papers were tested and showed absorptions ranging from 11 to 13.4 per cent., according to the degree of beating.

The same set of papers were also tested for their absorption capacities in direct contact with water. Weighed sheets were floated, one side only, on the surface of the water, then rapidly blotted and weighed again. As might be expected, the resistance of the papers under these conditions depended almost entirely on the hardness of sizing; the hardest sized papers only took up about 30 per cent. of moisture, whereas the soft-sized or unsized papers absorbed as much as 75 to 80 per cent.

In selecting a paper for protecting articles from damp the different qualities described above must be taken into consideration. Account must be taken of the form in which the moisture is likely to come in contact with the paper. For instance, cartridge cases will probably be protected from rain, but will be required to keep the powder dry in very humid weather, whereas electric wires are likely to be exposed directly to the rain. It is an unfortunate circumstance that very few papers are good in both respects.

SIZING WITH HARD WATERS.

Willi Schacht, in a note communicated on this subject to the Verein der Zellstoff und Papier-Chemiker, refers to the difficulty which is experienced in sizing the pulp when only hard waters are available, and this difficulty is still more pronounced when sizes containing high proportions of free rosin are employed.

One way of dealing with this difficulty is to keep down the proportion of hard water by using the size in as concentrated a condition as possible, and beating the pulp as thick as possible. But in this case a limit is soon reached beyond which the concentrations cannot be increased without impairing the quality of the paper.

Erfurt's emulsifying machine is useful for preparing very concentrated sizes from rosin soaps rich in free rosin. But the best way of sizing, when hard waters are used, is to boil a small quantity of an easily saponifiable animal or vegetable oil with the rosin; for instance, three to five per cent. of train oil or linseed oil. The mixed soaps thus obtained dissolve much more easily than all-rosin soaps. They facilitate the use of high percentages of free rosin in a remarkable degree. Their emulsions are much finer than those of rosin soaps and remain much longer in suspension; in the case of hard waters they give the hardest and most economical sizing of the paper.

RUBBER ROLLERS FOR WET PRESSES.

Two German papermakers have been experimenting with indiarubber as a covering for the lower rollers of the wet press instead of felt. One of them reports that the rubber lasts longer than felt, and permits of working with very firm pulps. The rubber gives a more compact sheet, and at the same time the speed of the press can be increased enough to make a marked increase in the output. The second manufacturer says that three years ago he was obliged to put in a rubber roller as a consequence of an accidental breakage of the axle of the lower roller covered with copper, and noticed the difference produced in his manufactures immediately. Printings became much more supple, showed wire marks less, and bore loadings with China clay better. Besides, a rubber sheathing for the lower roller makes up for slight irregularities in the covering of the upper roller. When the rubber surface has been made uneven by wear, it can be put right without removal by means of Schnitzer's apparatus. Rubber rollers have special advantages in working up pulps made from waste paper, as they yield slightly to lumps and grains in the paper.

CURE FOR BREAKS BETWEEN DRYERS AND CALENDERS.

A practical paper-maker writes as follows: I was running a small 62-inch machine, and had a great deal of trouble in the paper breaking at the draw from the dryers to the calenders. Although the edges of the sheet seemed to be perfect the paper would break and snap off, several times on a tour, and on light paper the breaks would come thick and fast. The super. I was working under was one of those fellows who would not stop to try to locate the trouble, but would tell you that you were getting $3 per day to run the machine, and if you could not run it he would try to get a man that could. Whether it was because he was afraid to fail if he tried to locate the trouble I do not know, but I do know that this is the way he would put a thing up to a man, and it was a case of must fix it or lose your job. One night, when I was troubled more than usual with these breaks, and after I had decided to let the job look after itself, I thought out a trick that overcame the trouble completely. By shutting off the steam on the last dryer and cooling it off I found that the paper did not break half as much as it did before, and I naturally concluded that the heat made that dryer larger than the one before it, and then had to figure a way of overcoming it otherwise than by keeping the steam from it, as running the dryer cold blackened the paper. The dryers were equipped with intermediate gears, and I finally hit upon the idea of removing the intermediate gear between the last two dryers, and by running the dryer felt good and tight it was able to turn the last dryer, and consequently eradicate entirely the old trouble. From the time I did this we were never again troubled with snap-offs on that machine, and very often cracks in a half inch on the paper would go through the calenders without breaking. This experience led me to believe that the last dryer of paper machines should be so built as to allow it to be a wee mite smaller than the preceding one.

FAULTS OF CYLINDER-MADE BOARDS.

A writer in the "Holzstoff-Zeitung" states that in good class boards made on the cylinder machine a fault is frequently observed which shows itself in the form of long, broad creases, which are produced, generally near the edges, on the sheet of paper as it is transferred from the wet couch felt to the press roll on which the board is being made up. These creases are most frequent when the couch roll which picks the paper off the wire cylinder is very thickly jacketed, and particularly after the machine has been started again after a long standstill. The cause of the creases is the drying up of the wet couch felt, and of the felt jacket of the couch roll. By drying the felt becomes full of air, which becomes imprisoned when the felt is wetted to start again. When the pressure comes on the felt in the operation of couching the imprisoned air attempts to escape, but its free egress is prevented by the sheet of paper on the top of the felt. In this way a blister of air is formed between the paper and the felt, and when this reaches the making-up press roll, the blister is pressed forward in the form of a long crease about 1½ inches wide. The edges of the crease appear raised and the middle depressed. These creases occur most often near the edges of the sheet because the felt jacket dries most rapidly at the edges. In order to prevent the fault the couch roll should be kept under water during a standstill or else it should be run without making paper for several minutes before starting up, and while so running the felt and roll should be sprayed with water until the air is displaced.

CHLORAMIN REACTION OF PROTEINS.

At a meeting of the London section of the Society of Chemical Industry a paper was read by C. F. Cross, E. J. Bevan, and J. F. Briggs, on the "Chloramin Reaction of the Proteins and Technical Applications." In the course of the introduction, it was remarked that "the interactions of the simpler amines and the halogens have been studied by numerous observers. One of these reactions of particular interest, for reasons which we hope to make evident by the present communication, is that which leads to the production of monochloramin, NH_2Cl. This compound is readily obtained in solution by the interaction of chlorine (water) and ammonia, but more conveniently by substituting a hypochlorite for the free halogen. In a brief account of this reaction by E. Raschig, it is shown that it takes place according to the equation: $NH_3+M'OCl=NH_2Cl+M'OH$. The product reacts with iodides similarly to the hypochlorites, thus, $NH_2Cl+2HI=NH_3+HCl+I_2$; that is, using the terminology of "bleaching" chemistry, the "active chlorine" is double the actual combined chlorine. But the other chloramin is in other respects markedly different in chemical activity from the hypochlorites, notably in the extreme feebleness of its bleaching actions. Although unstable and readily decomposing according to the equation, $3NH_2Cl = N_2+NH_3+3HCl$ under certain conditions it undergoes the characteristic synthetic transformation to hydrazine—thus: $NH_2Cl+NH_3 = H_2N.NH_2,HCl$. The conditions specified by Raschig are, to heat together 200 c.c. aqueous ammonia (20 per cent. NH_3) with 100 c.c. of normal sodium hypochlorite in presence of a small quantity of gelatin (0.05 grm.) which he has found to favor the reaction by "raising the viscosity of the solution." The resulting hydrazine is obtained in the form of sulphate on adding sulphuric acid, or as the relatively insoluble double salt $CuSO_4.N_2H_2SO_4$ on adding a saturated solution of copper sulphate. The yield of hydrazine under the above conditions is 40-50 per cent. of the theoretical. The general import of these reactions is indicated in a paper by the same author thus: Phenylhydrazine has been obtained from aniline. As a means of introducing the amino group it is shown phenol and the simple chloramin give p-amino phenol followed by interaction of two molecules with production of dihydroxydiphenylamine, which is directly oxidized to the indophenol. This explains the blue reaction of phenol solutions containing ammonia with hypochlorites.

"The author also discusses the formation of dinitroazo-benzene from p-nitraniline, and fully discusses the interaction of aniline and hypochlorites. These discussions are limited to bodies of the aromatic group.

"We note in a paper by Knecht and Milnes on 'The action of chlorine on wool,' that the chlorinated wool was observed to retain its activity towards potassium iodide after many hours. The authors suggest that the results may be due to free chlorine or chlorinated quinone-like bodies. Other authors have dealt with the interaction of chlorine and hypochlorites with ammonia. Noyes and Lyon have investigated the ultimate breakdown to nitrogen. J. Effront has proposed to use the interaction of hypochlorites with ammonia and proteins in drinking waters, that is, under conditions of extreme dilution. He refers incidentally to the formation of nitrogen chloride (Chlorstickstoff), but regards the reactions involved as those of destructive oxidations. We shall revert to his observations on the proteins in a later communication.

"We are concerned at the moment with the widely diversified group of such derivatives, viz., the nitrogenous colloids, which we shall refer to under the group

designation of proteins, used in the general sense, and without reference to the special classifications of the most recent literature of this vast field.

" These bodies react with chlorine and the hypochlorites to form chloramin derivatives. Our observation of these reactions and their products has satisfied us that they take place in constant and characteristic quantitative proportions, and that the derivatives are simply related to the original substance, that is, are formed without destructive actions. Hence, these reactions may be made the basis of a number of quantitative methods which prove useful in the province of technical investigations. But further, such reactions occur in a number of industrial operations the significance of which will be found to be further elucidated by reference to the fundamental facts established for the simplest chloramin derivatives."

A considerable portion of the paper then treats with various experiments on flax, and these conclusions, although of primary importance to the textile trades, are not uninteresting to certain sections of papermakers. They are as follows:—

" (1) No flax fabrics washed from hypochlorite treatment can be safely assumed to be free from ' active chlorine,' however thorough the washing.

" (2) The fixation of chlorine as ' active chlorine ' is in general in direct proportion to the nitrogen contents of the fabric. It is probably actually proportionate to the amino-groups of the protein constituents. It therefore progressively diminishes as these are removed through the various stages of bleaching.

" The reaction conversely is a test of the purity of a bleach, and will be found of use in comparing one bleach with another.

" Low-bleached damasks when treated with chlorine gas will be found to have a marked chloramin reaction, and it is important to note that the nitrogenous bodies thus reacting are the most resistant of the non-cellulose impurities, and are the last to be eliminated in the cellulose bleach.

" (3) A hypochlorite liquor which has been used upon flax goods may contain some form of dissolved chloramin chlorine, which is not only devoid of bleaching action, but may influence prejudicially the action of the bleaching bath.

" These conclusions are of direct import to the flax bleacher, and follow immediately from our experimental results and actual observations of the industrial processes and their products. In so far as they have not entered into consideration in the conduct of flax bleaching, they afford a new basis of experimental observation and control of the processes. But by control we must understand as chemists the regulation of processes to bring about particular results. If, for instance, it is recognized that to the more obvious functions of the hypochlorite bleaching liquors, which are those of hydrolysis and oxidation, we must add that of chloramin production, it becomes necessary to reinvestigate the processes in relation to this function. We make this suggestion to those interested directly or indirectly in the industry. But as the lines to be followed in such an investigation will be obvious to every chemist, it is unnecessary to develop the matter in detail."

Dealing with chlorine and gelatin, the paper states that " the interaction of these bodies may be made to give results which are sufficiently constant to afford a quantitative method of determination of the protein. In order to secure these results we have first to reckon with the fact that a mass of gelatin is only attacked superficially. If a sheet of dry gelatin of convenient thickness be immersed in a solution of hypochlorite for some hours, the gelatin will be found to have swollen almost normally, but the surface will have a hard feel which suggests its insolubility. After exhaustive washing of the swollen sheet, sections of same when placed in potassium iodide solution are found to show the chloramin reaction in superficial layers of varying thickness. If the section be boiled with

water the interior portion is found to be perfectly soluble, but the two surfaces remain in the liquid as insoluble films. Thus we may say that hypochlorites have a 'tanning' action on gelatin in converting it into its chloramin, and that the product constitutes a semi-permeable membrane, which permits the passage of water, but prevents the diffusion of the hypochlorite. To secure a general attack we have found it necessary to use chlorine gas, and to diffuse the gelatin though a mass of inert material presenting an indefinitely large surface, for which purpose cotton yarn is very convenient. Cotton yarn was impregnated with known quantities of gelatin solution containing aluminium sulphate, and then dried. Weighed quantities of this yarn containing a known weight of gelatin were steeped in cold water to hydrate the gelatin, they were then squeezed out and exposed to an atmosphere of chlorine for one hour. Exhaustive washing of the chlorinated product gave variable final results, because soluble products presumably formed by hydrolysis of the chloramin appeared to diffuse indefinitely, and the results in chlorine decreased as the time of washing was prolonged. We were able to arrive at a fixed point by suspending the yarn without washing in a current of air from a small fan, until perfectly dry. The yarn was then placed in an excess of N/10 sodium arsenite solution (diluted) about one hour being allowed for complete penetration, and the excess of arsenite was titrated back with N/10 iodine. It might be presumed that the proportion of active chlorine fixed would be a measure of the quality of the gelatin, but we find that such is not the case, and that three samples of skin gelatin of very different qualities gave approximately identical results. As the mean of a large number of determinations we have fixed the proportion of active chlorine taken up by gelatin under these conditions at 15.4 per cent. of its air-dry weight. This number is not appreciably changed if the gelatin be previously combined with formaldehyde. Further, if the chloramin be immediately destroyed by sulphurous acid and washed, the gelatin will again take up the same amount of active chlorine on a second treatment with the gas.

"From this work we have evolved a method for the detection and estimation of gelatin in tub-sized papers. The qualitative test possesses the advantage that any number of samples may be tested simultaneously, and that a very small fragment of each sample is sufficient. We have to bear in mind that iron compounds which are present in traces in the majority of papers would interfere with the test. In order to eliminate this error, and to arrive at a rapid result, we place the moist fragments after chlorination in a bath of 2 per cent. solution of sodium phosphate previously heated to 45°C. and leave them for exactly five minutes. This reduces the otherwise inconvenient delicacy of the reaction, and ensures that only papers containing proteid matter will show a positive result. The fragments are removed from the bath and tested with potassium iodide and starch. Papers containing only 0.5 per cent. of gelatin still show a strong coloration. It should be noted that the presence of large quantities of mechanical wood pulp in a paper will produce a faint chloramin reaction owing to traces of proteid matter contained in raw wood. For the quantitative determination we suspend the sheets of paper after chlorination in front of the fan and expose to a full blast of air for at least 1½ hours. We find that exposure for only ¾ hour gives too high results owing to the greater density of paper as compared with cotton yarn, whilst exposure for 2½ hours gives the same result as for 1½ hours. The paper is then torn up, placed in N/100 arsenite for a considerable time (at least one hour), and the excess titrated with iodine. If these conditions be followed, the divisor 15.4 noted above gives the quantity of gelatin in the paper as shown by the following examples:—

Paper	Percentage of gelatine by Kjeldahl (air dry weight) N % x 6.53	Percentage of gelatin by chlorine (air dry weight)		
Ordinary note paper (air dried vellum)	7.1	7.1	7.25	7.4 7.3
Typewriting paper (cheap quality)	2.62	2.8		3.0
Hand-made ledger paper (Royal)	*8.15	7.7		7.7

* This number has been corrected for ammonia alum, which was used in the size in the proportion of 15 per cent. on the gelatin.

HOW TO MAKE A GOOD SHEET.

Under the above caption in Paper Trade Journal an old paper-maker writes as follows:—When a paper buyer is willing to pay the price he can get a paper that will be as good as any ever made in the "olden days," notwithstanding what we read of the passing of real "A1" paper. To get such a paper nowadays means that the buyer must be willing to give the manufacturer plenty of time and money, and he must not be disappointed should he not get his paper on the promised day of delivery, for mills are not making a practice of turning out extraordinary paper in these times, and consequently the men in the mill must do a little practising and experimenting before they can obtain just what is wanted.

The buyer usually stipulates that the paper must contain a certain per cent. of the very best cotton rags, and the very best of the little loading the paper may have to contain, should a good finish be desirable. It is an understood fact that everything going into the paper will be of the very best quality. The color of the paper must be of extraordinary whiteness and clearness. No marks of any kind are to appear in it when it is held to the light, and it is to be well sized, possess good tearing qualities and several other things besides. A letter usually accompanies such an order for paper, in which the writer sets forth at length the importance of getting everything absolutely right.

When the superintendent of a mill is confronted with the above he must not be taken too seriously should he become a little nervous and irritable. It is only natural that he should wish to be left alone, for he wants to think. He must first secure the proper rags and arrange for their treatment in the mill. He must hammer into the rag room foreman's head the importance of what he is about to undertake, and he must make that foreman feel as if he is the one man in the mill that he is depending upon to make that paper just what it should be. The foreman must then impress upon his help what he has had impressed upon him, and he watches them like a warden does his prisoners, and when the rags pass from the rag room he feels that his part in making perfect paper has been accomplished. The superintendent uses the same method in getting the men on the cooker; he lays it on so thick that he leaves them thinking should the paper not be the right kind in all ways they alone would be held responsible. They are told the amount of chemical to put in the cook and the number of hours to cook the rags.

The real trouble starts when the rags are ready for the beaters. The beaterman has received elaborate instructions regarding the paper to be and he is on his toes. The beater is furnished, and the beaterman watches the beater roll as a cat does a mouse; he connects with the bed plate of the beater by holding a piece of stick on it, the other end being placed against his ear, and he does this so often he becomes confused by the sound of the beater roll on the bed plate, and he monkeys with it so much that he is all at sea, and in the end has very little idea as to the exact beating of the stock. He wishes to get it so nice he imagines all kinds of things. The super comes along and feels of the stock and complains that it does not feel just as it should. This is the straw that breaks

the camel's back, and the poor beaterman is up in the air very high and gets terribly twisted, and unknown to the super he makes a mess or an impossibility of getting that paper as it should be. He has the stock beaten too quickly to give it the desired quality. He has been accustomed to beating stock four and five hours, and though told to consume at least ten on this particular order, he had it well beaten in six, so well in fact that it was foolish to keep the roll on it, as the stock in the beater was hot and totally unfit for the kind of paper it was intended for. The heat destroyed the color and darkened the fibre itself. However, he must obey orders, and leave it slosh around in the beater the required ten hours, and by that time it is so hot that when it goes to the machine it will not hold the water long enough to see it, and the machine man, who was also impressed with the importance of this paper, is at a loss to make it act as it should on the wire. He moves the slices up and then down; he has all the water he can get going into the paper, and yet it is not right and nowhere near it. As the paper is being taken over the machine the super strolls leisurely into the room; he is waiting until the paper is placed upon the reel, for he is to get a piece of it and match it with the sample which was made in the days long ago. He tries to appear unconcerned and calm, but within he is in a turmoil, and is just crazy to get his hands on the paper and to know the worst. He has a sneaky impression that it is not going to be just what he requires, for the stuff did not feel just right in the beater, and as he walks on and sees it going along the wire he knows that it is not going to be what he wants. But if the color is right he figures that he can fix up the other things very nicely.

The paper is placed upon the reel, and he takes a piece of it and looks through it, and if he followed his inclinations he would fight with some one, for, instead of a nice, clear look through, it has that muddy, scraggy look so much despised by makers and buyers alike. The surface color shows up the same defect, and the super. starts on the warpath without further thought, it leading toward the beaterroom. The beater man seems to have suspected something, and saw the super as soon as he came into the room. The usual oration is soon flooding the room, accompanied by wild gesticulations upon the super.'s part. and a meekness unheard of on the beaterman's. The super. shoots his hand into one beater after another, and declares it "Mud, nothing but mud." He leaves the beaterman to think what an incompetent individual he is while he strolls around at random, thinking what he will do next. He decides to try again, and also decides that he will beat the stock himself the next time. The next day the same thing comes again, and, though the super. does not actually do the beating, he sees to it that it is done properly, and so everything goes to the machine lovely. The super. takes the pains of notifying the machine tender that he has beat the stock himself, and that it is all right, so it is now up to the machine man to give what is wanted.

The paper is put over the machine, and the super. takes out a piece, feeling a little more sure of himself this time. He finds it a much better paper, but still not inclined to be clean looking; he tells the machine man to run slower or do anything else he wants to, but the paper must be better closed, and more even sided, and from that moment the machine man feels that it is his turn to become a little worried. He tries this, that and the other thing in his efforts to make what is required. Meanwhile the super. is chasing the color and coaxing it along to a certain clearness that he would like to see in it. By the time he gets it the machine man thinks that he has got a satisfactory paper, but finds out his mistake when the super points out what he wants to see in that paper. It must be still closer and of a finer surface, and in

order to get these qualities he keeps that machine tender busy for a long time; the machine man is made to try it several different ways, and begins to wonder whether the super. does really know what he is after. Finally, when the super. is satisfied that he has done all that mortal man can do, he cautions everyone to hold it just where it is, and the perfect paper goes from that mill after having caused untold worry and work, and perhaps money.

The paper is shipped, and in nine cases out of ten the buyer is dissatisfied with it, even though it be as good as his sample. He has the idea that perfect paper making is a lost art; so the paper makers suffer.

—It is stated that the cut of pulp-wood for the International Paper Co. will be only about one-half of what it was last winter. This curtailment will affect New Brunswick as well as other parts of Canada. In New Brunswick, where last year about 40,000,000 feet of pulp-wood was cut on the Miramichi, the cut this winter will be about 18,-000,000 feet, a reduction of more than 50 per cent.

—A French patent has lately been granted for a new kind of polishing paper intended to replace emery and other abrasive papers, which have been merely vehicles for holding powders or other granulated substances. In view of the latter frequently becoming loose before accomplishing their purpose, the new invention is based on the paper absorbing them in their entire thickness. The result is obtained by incorporating with the paper, while in the state of pulp, from 15 to 300 per cent. of the emery or similar material, according to their density and the contemplated employment of the paper. The paper does not undergo any modification, but its density varies according to the specific gravity and the quantity of the substances introduced.

BOILER SCALE AND ITS PREVENTION.

All water, especially surface waters, says A. D. Little, chemist, Boston, contains more or less mineral matter in solution, which remains in the boiler as an encrustation when the water is boiled away or converted into steam. The mineral ingredients most commonly found in water, and which cause the formation of boiler scale, are the salts of calcium and magnesium. When the water is converted into steam the substances gradually separate from the solution in the form of deposits and coat the inner surface of the boiler with scale.

Scale formation is detrimental in several ways. It is a non-conductor of heat, and the fires must, therefore, be driven harder to accomplish the same results. The water becomes separated from the boiler plates, and these latter become overheated and are gradually burned out. The tubes and feed pipes of the boiler become more or less clogged, and consequently become less efficient. Some of the scale forming ingredients, especially magnesium chloride, also exert a corrosive action upon the iron.

The aim of a boiler compound is to convert these substances into insoluble compounds, which settle in the form of sludge or mud, and can be removed from the boiler by blowing or washing.

We could prepare a list of nearly two hundred materials which are known to have been used for boiler cleaning purposes, but there are only four of these which are worthy of mention. They are: Soda ash, or sodium carbonate, caustic soda, tannin and kerosene.

Soda ash is an alkali, and will neutralize any acid in the water, and also precipitate of lime, magnesia, iron and alumina, in the form of soft sludge, which can be easily removed when the boiler is cleaned.

Caustic soda is also an alkali, and neutralizes acids and aids in the precipitation of the various salts.

Kerosene is used in connection with the above to prevent foaming or priming.

Tannin is also used to prevent foaming or priming, and will precipitate certain mineral matters, although it is not so efficient in this respect as soda ash or caustic soda.

TRADE INQUIRIES.

The following inquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these inquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or publishers "Pulp and Paper Magazine," Toronto:—

1535. **Paper.**—A South African firm of general merchants desire to be placed in communication with Canadian manufacturers of printing and wrapping paper. Samples and quotations, c.i.f. Cape Town and Durban.

1630. **Paper and Pulp.**—A London firm of paper-makers' agents wishes to be placed in communication with Canadian exporters of paper and pulp.

1651. **Stationery Trade.**—A business man in Barbados, now in the stationery trade, wants a line of Canadian office specialties and devices to canvass.

1661. **Paper Sacks.**—A firm largely dealing in cement, desires to be placed in communication with Canadian manufacturers of damp-proof sacks suitable for holding 112 pounds of Portland cement. Quotations desired by the thousand for c.i.f. shipments into Manchester.

1674. **Paper.**—A London firm manufacturing writing, printing, brown, colored and surface papers, also all kinds of stationery, notepaper, cards, etc., wishes to open up correspondence with some Canadian firms with a view to business.

—Arthur C. Hastings has been elected president of the American Paper and Pulp Association, D. S. Cowles, the late president, not having the time sufficient to push the organization along the aggressive business lines which have now been determined on.

—Bavarian papermakers complain of the increased cost of production. It is thought, however, that owing to a combination of the makers of superior paper in South Germany with a view to put a stop to continuous underbidding amongst themselves, a strong basis for a better market has been laid.

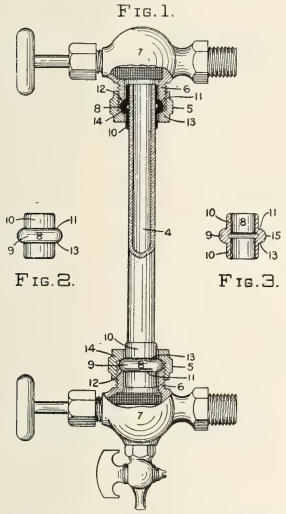
—The fires in the Ottawa Valley district have had the effect of causing a large demand for bush laborers. Owing to the fact that burnt areas will be of little value unless cut over immediately, the lumbermen are putting in as many men as possible to take out the good logs, though as a rule they already have a large supply on hand.

—In the revised Australian tariff, printing paper, which is almost all that comes from Canada, is still free, but printing matter for advertising purposes has been doubled in duty. Instead of being 3d. per pound as in the 1902 tariff, it is now dutiable at 6d. per pound or 35 per cent., whichever may produce the highest return. Brown papers have been advanced from 3s. per cwt. to 5s. per cwt., and straw boards from 1s. per cwt. to 1s. 6d. per cwt. Stationery manufactures, formerly 25 per cent., are now 30 per cent. under the general tariff and 25 per cent. preferential. Pulp board for coating purposes has been put on the free list. Tissue, "cap paper," copying paper and paper for patterns have also been made free.

NEW GASKET FOR GAUGE GLASSES.

The tip or lip bulb gasket, shown in accompanying illustration will be welcomed by those who have suffered the inconvenience of broken water gauge or lubricator glasses.

The application of the lip gaskets to a gauge glass is shown in Fig. 1. In Fig. 2 the gasket and in Fig. 3 a cross section of the gasket is shown. It is globular in form, and compresses easily, making a steam and water tight joint,



Tip or Lip Bulb Gaskets.

and avoiding all danger of breakage by expansion. They are easily adjusted. The lip or tip gaskets are made in five sizes,and two special sizes having the bulb without the tips are made for the use of plumbers and others in steam and hot water packing.

A wood plug is furnished with the ½-inch, ⅝-inch, and ¾-inch sizes, which simplifies the applying of gasket on the glass.

These gaskets are manufactured by the patentees, Gilbert & Hawkesworth, and are sold by Alfred Hawkesworth & Sons, Company, Limited, Montreal.

JAPANESE BUCKWHEAT PULP.

Scientists in Japan have been investigating for some time into the possibility of discovering a substitute for wood pulp in the manufacture of paper. The consumption of wood-pulp in Japan and other countries to which she looks for her supply of pulp in the future is increasing so rapidly as to make the question of finding a supplementary source of material for paper-making one of immediate interest. An announcement that has just been made regarding the possibilities of manufacturing paper from buckwheat straw has created considerable interest, both among the Japanese manufacturers and consumers of paper. For a while it was hoped that the pulp made from rice straw, rags and waste would supply the reasonable demand in the market; but the materials have increased so enormously that these sources have been practically closed. The pulp that is now made from buckwheat stock is the result of many experiments on the part of a leading scientist. He claims now that he has not only been successful, but that the product of his manufacture is decidedly economical. The Canadian Trade Commissioner in Yokohama reports that the paper made from this pulp is excellent, and that the Japanese paper which is made with a mixture of buckwheat pulp is much better than that which is made, as heretofore, mostly from wood pulp. The new product produces a result that is smoother, less blurred, has more lustre, and is a better paper than when made from wood pulp. It is stated that while wood pulp costs about 1s. 3d. per kwan (8½ lbs.) buckwheat pulp, as the new material is called can be placed upon the market for from 7½d. to 10d. per kwan.

SULPHITE BOILING.

When the use of direct steam came into vogue for sulphite boiling, it was soon found that the advantages associated therewith were accompanied by the very

serious drawback that the paper made from the pulp was usually much weaker than paper made from pulp boiled up by indirect steam.

The reason for this was first sought in the treatment of the mass in the hol lander, but it quickly appeared that this idea was entirely erroneous. The next theory was that the trouble was caused by the use of old wood for making the pulp; but this was also negatived, as the results continued the same, even when the pulp was made from very carefully selected wood. Continued observation, however, showed that the tendering took place on the drying cylinder as soon as the paper was dried in the open air, i.e., without any kind of artificial heat, the tendering of the paper made from pulp boiled by direct steam practically disappeared. There can, however, be no doubt that the tendering is due not so much to the use of artificial heat for drying, but to the use of excessive temperatures maintained with the view of shortening the time of production. The lye being sour, the use of high temperatures causes a certain amount of parchmentation, and hence loss of the identity of the fibres and consequent weakness of the paper. In fact, part of the mischief is done in the boiling. Direct steam has a greater heating action and a greater mechanical action on the fibre than indirect steam, and it is nearly as important to regulate the temperature of the boiling as that of the drying cylinders. It will be found that if the boiling takes the form of gentle simmering, and is stopped the moment the pulp is ready, and if the paper is dried gradually with several gently heated drying cylinders, rather than with one or two heated to a high temperature, the pulp will make paper quite as good as any that can be prepared by sulphite pulp cooked by indirect steam.—Papier Fabrikant.

CANE AND BAMBOO IN PAPER-MAKING.

A new industry, that of paper-making, seems to be on the point of arising in Trinidad. A local manufacturer has procured paper from the fibre of cane megass and bamboo, and, according to Professor Carmody, who presented some specimens of the paper to the Trinidad Board of Agriculture, the future of the new industry is assured, as the demand for fibre is great, and Trinidad, according to the professor's calculation, ought to produce about 49,000 tons of fibre from the canes ground annually. Paper made from bamboo fibres is said to retain its whiteness and to escape attack on the part of insects. Professor Carmody produced a copy of a paper-makers' journal printed on paper made in 1879 from fibre of bamboo, which showed no signs of yellowing and was otherwise in a perfect state.

THE FORT FRANCES ENTERPRISE

In connection with the incorporation at St. Paul, Minn., of the Minnesota and Ontario Power Company, capitalized at $7,000,000, it is stated that the company has now completed negotiations with the Backus & Brooks syndicate for the purchase of its holdings near Fort Frances, Ont. Contracts have been let to the engineering firm of J. G. White & Co., New York for the erection of great dams and power stations at that place and at International Falls, and for the manufacture of mechanical and sulphite pulp. The company will also generate and make available for general manufacturing purposes electric energy and power in sufficient quantities to supply the needs of the vicinity. The initial work, it is stated, will be the completion of the dam and power stations, producing a minimum of more than 30,000 continuous horse power, and the construction of the first unit of installation of the sulphite and paper mill plant, having a daily capacity of 200 newsprint paper and 50 tons of sulphite pulp. When

the first unit is in operation, the company will double the capacity of the sulphite paper mills. Those interested believe that International Falls and Fort Frances will become one of the largest, if not the largest paper producing points in the world. The officers of the new corporation are: President, E. W. Backus; vice-president, Alexander Smith; second vice-president, John A. Davis; secretary and treasurer, William F. Brooks; manager, Warren Curtis, Jr. The financing of the company has been accomplished by the sale of its stock to strong financial interests in the United States as well as Canada, and by the sale of the company's bonds to Peabody, Houghtelling & Company, Chicago, thus providing ample funds for all the company's needs. Recent reports state that work on the dam &c., has already started.

THE MARKETS.

Toronto, Nov. 14, 1908.

A ground wood famine is practically under way at this moment, pulp being

WANTED BY SWEDE.

Swedish gentleman is open for engagement in Canadian mill. Experienced in Swedish processes of pulp and paper-making, and has worked on Kraft papers. Understands sulphate method and recovery of waste from sawmills for pulp purposes. Address Box 10, care "Pulp and Paper Magazine," Toronto, Canada.

To Pulp Manufacturers.

Young Scotsman, with live connection amongst English and Scottish mills, wants to hear from Canadian Wood Pulp manufacturers who are wishing to build a business in Great Britain. Advertiser has lived some years on the Continent and in U.S.A., and speaks German. Full particulars and references when required. Address

J. M. S.,
Pulp & Paper Magazine, Toronto.

Pulpwood

Offers wanted for from one to three thousand cords of spruce and balsam, to be delivered next spring. Correspondence solicited.

W. L. Hime,
160 Dowling Avenue,
Toronto, Canada.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

WANTED

One good second hand Beating Engine, must be in first class condition. Capacity 800 to 1,000 pounds dry stock. Mail full particulars of what you have to offer with lowest cash price. Address 'DOMPAP,' care Pulp & Paper Magazine.

Position Wanted

Superintendent open for Engagement.

A1 on Book, Bond, Blottings and Coating Stock 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc. Address M. R. J. care Pulp and Paper Magazine, Toronto.

Wanted

Position as superintendent or designer of sulphite pulp or wood pulp paper mills. Large experience, as well from European as from American Mills. Consumption of sulphur in last **sulphite** mill built, **8%**. **Brown,** steamed woodpulp and **"natural"** brown paper, **specialties.** Highest testimonials for economical construction. Best references. Correspondence solicited. Address,

"C. E. B,"
Care of Pulp & Paper Magazine.

Position Wanted

Englishman with family, desirous of settling in Canada, would make a change, and invites correspondence from parties needing Foreman Papermaker. Have had 8½ years as Night Superintendent and 6½ years as Day Superintendent, in one of the most successful large Pulp and Paper Mills, making best sulphite dapers, mill making 31% profit and paying 20% dividend. Exceptional good references from other successful mills. Address

"DESIRABLE"
Care of Pulp & Paper Magazine

difficult to obtain at any price, though we have heard of some parcels fetching as high as $26. While some observers believe this is only temporary and that conditions will change within a month or so, there is no doubt but that the shortage of water has brought about a situation which has its serious features. The Ottawa River is lower than it has been within a generation, and the mills there have been greatly handicapped, both the Booth and Eddy mills having had to close down. A few rains have fallen in some sections, but the ground was almost so unprecedentedly dry that it would require much more precipitation to bring about much change in the conditions. And the season is now so late that it is doubtful whether enough can now fall before the general freeze to do much good. Sulphite pulp is in good demand at $38 to $40. There is already a noteworthy scarcity of news print in this country, and it is contended by some that with any really strong revival in trade the shortage would be seriously felt. As it is trade has improved distinctly since the Canadian and American elections, and strong hopes are expressed that any depression will be hard to find by the beginning of the coming year. The improvement in demand is to be noted not only in news but in the better grades of paper, particularly the finer qualities of book, writing and ledger papers. Wrapping paper has been advanced 15c. per cwt.

British.—Trade in both mechanical and chemical pulp is dull, especially for the latter. It is not considered probable, however, that there will be any price reductions as the mills will likely curtail production first.

Chemicals.—The World's Paper Trade Review quotes London prices for chemicals as follows, with a steady market:—Ammonia alkali, 58 per cent., stands at £4 15s.; bleaching powder (soft wood), £4 12s. 6d.; caustic soda, 76-77 per cent., £11; soda crystals, £2 17s. 6d.; salt cake, £2 2s. 6d.; recovered sulphur £5 to £5 5s.; sulphate of alumina and blanc fixie unchanged.

PAPER STOCK MARKET REPORT.

Montreal, Nov. 14, 1908.

There is not much change in prices of paper stock. Quotations range about as follows:—

Unbleached cuttings	$3 75 to $4 25
White shoe clips	4 00 to 4 50
Colored shoe clips	2 50 to 3 00
Domestic white rags	2 00 to 2 25
Blues and thirds	1 10 to 1 30
Roofing stock	0 45 to 0 70
Manilla rope	2 00 to 2 25
Waste papers	0 35 to 0 50
Bagging	0 50 to 0 70

CHAPTERS ON PAPER MAKING.

The fifth volume of Chapters on Paper Making by the well known paper expert and lecturer, Clayton Beadle, is now to hand. It deals with the theory and practice of beating, a subject to which the author has given a great deal of special attention during the past few years. His conclusions are drawn from actual tests undertaken by different papermakers. It may be remarked that the subject of heating has been, comparatively speaking, but little studied from a scientific standpoint. For this reason the data presented, and the work recored in this text-book are largely in the order in which the results came to the author's notice. So much depends upon the beating process that it may almost be said to be the very centre of paper making. The book is therefore a very valuable one. It is designed not only for students but for paper manufacturers, their managers, and all those who wish to keep abreast with the time's most economical improvements. Attention is also given to the question of power consumption with a view of effecting important economies, as well as improving the qualities of the product. The publishers are Crosby Lockwood & Son, of Stationers' Hall Court, London, E. C.

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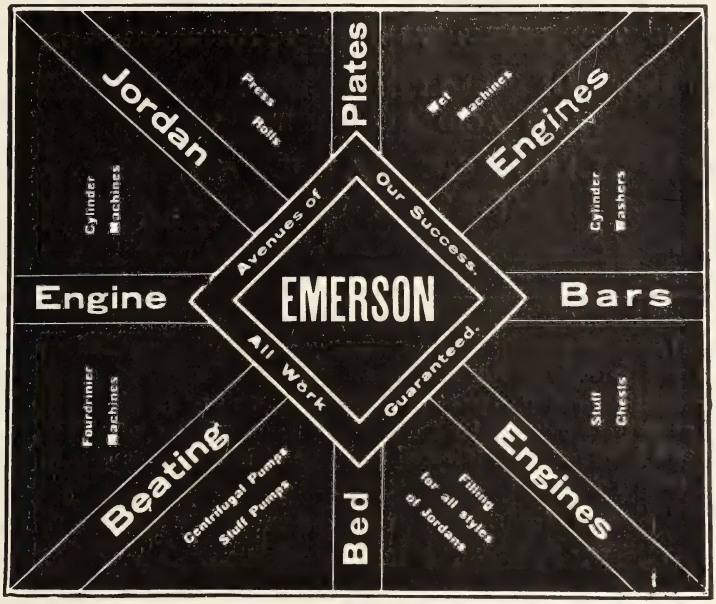

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They are really acid-proof and practically indestructible.

All Digesters lined with Panzl's patented composition, now as tight and in as good condition after years of continuous use as they ever were, no leaks and no repairs.

Panzl Linings can be made considerably thinner than the other linings, thus increasing the capacity of the digesters.

The composition and the system of constructing of Panzl Linings are patented in all countries where wood pulp is being manufactured by the sulphite process. **The PANZL U.S. Patents have been adjudicated to be valid in law** and wholly independent of all prior patents relating to linings of digesters.

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Operated by him in Megantic District
Load 60 cords of 4 ft pulp wood
Weight of load 200 000 lbs
" " Sleds 55 000
Hauled 10 miles from loading point

¶ The Lombard Steam Log Hauler is the only practical and satisfactory Log Hauler ever designed or built.

¶ It will work and help out profits wherever horses can work, but its money-saving qualities come into highest play on hauls four miles long and upwards over comparatively level roads preferably iced.

¶ Under ordinary conditions the Lombard Hauler will take the place of at least 50 horses with their company of drivers.

¶ In the crew of the Log Hauler there are only three men, Engineer, Fireman and Pilot, and when operations are suspended for any reason the expense upkeep is practically nothing.

¶ Descriptive circular sent on request, it will interest any wide-awake lumber operator.

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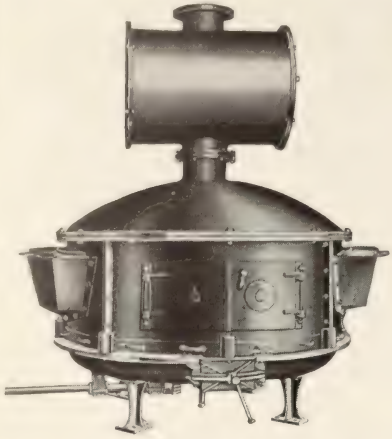

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Costs less to install and maintain than any other type of burner on earth.

Capacity Very Elastic

It will economically consume from 6,000 lbs. up to 17,000 lbs. of Brimstone in 24 hours. MAKES A CONSTANT RICH GAS, testing as high as 19.7 per cent if desired.

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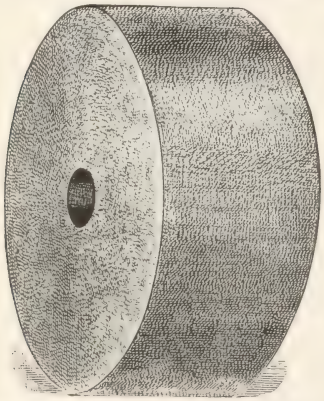

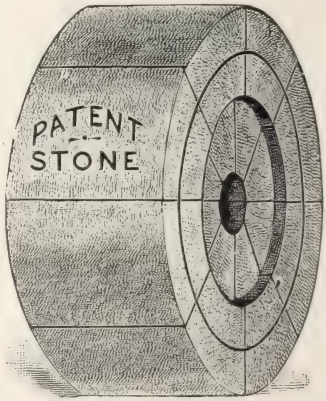

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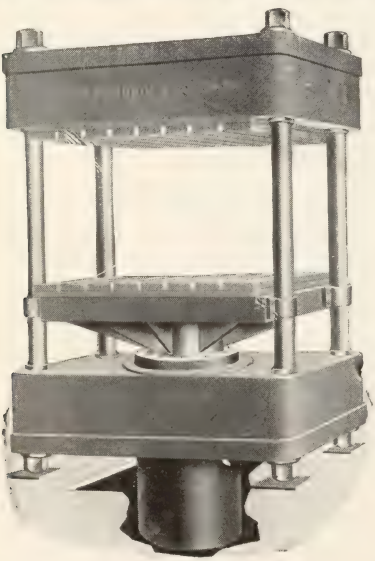

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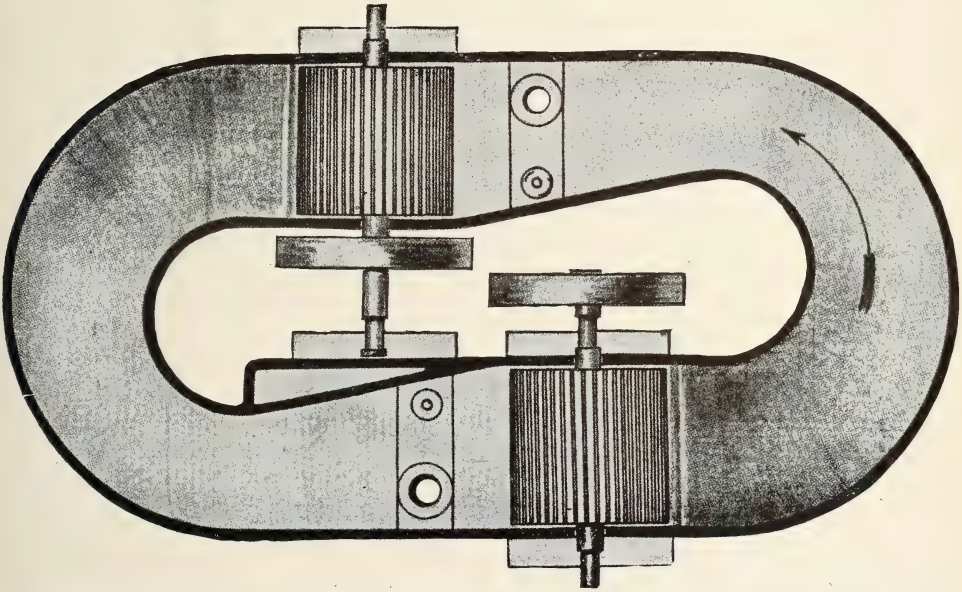

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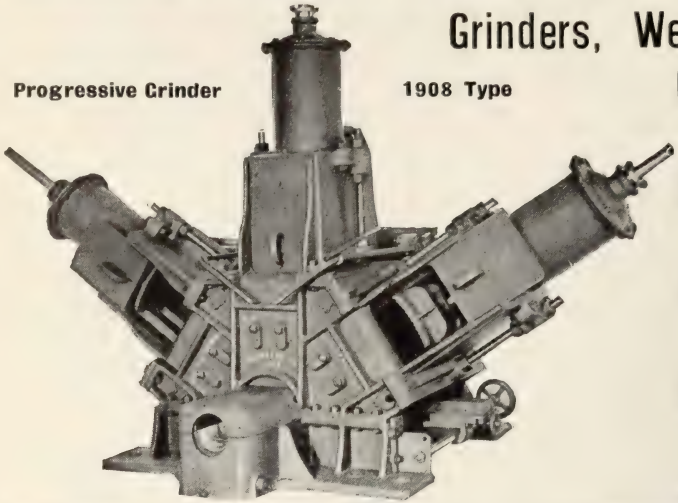

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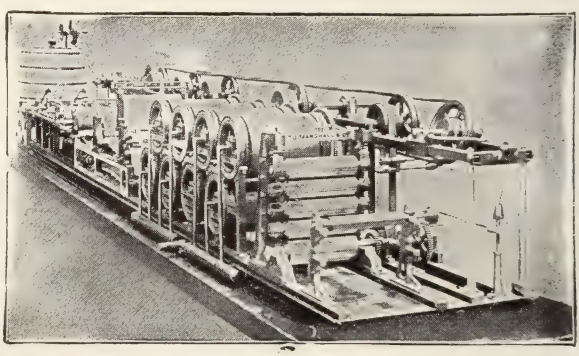

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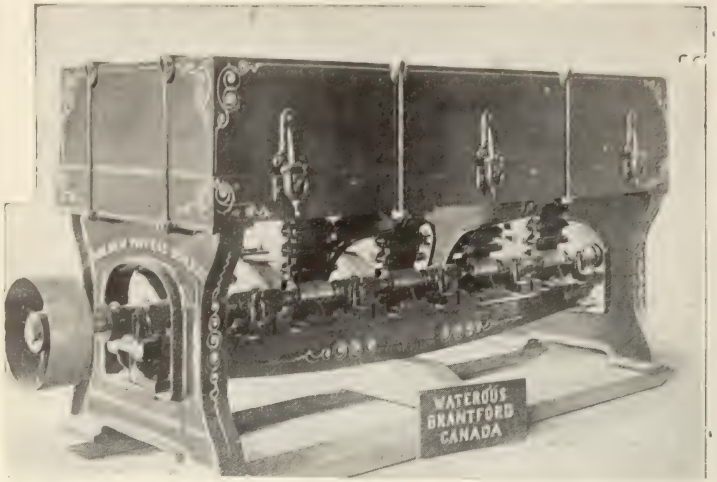

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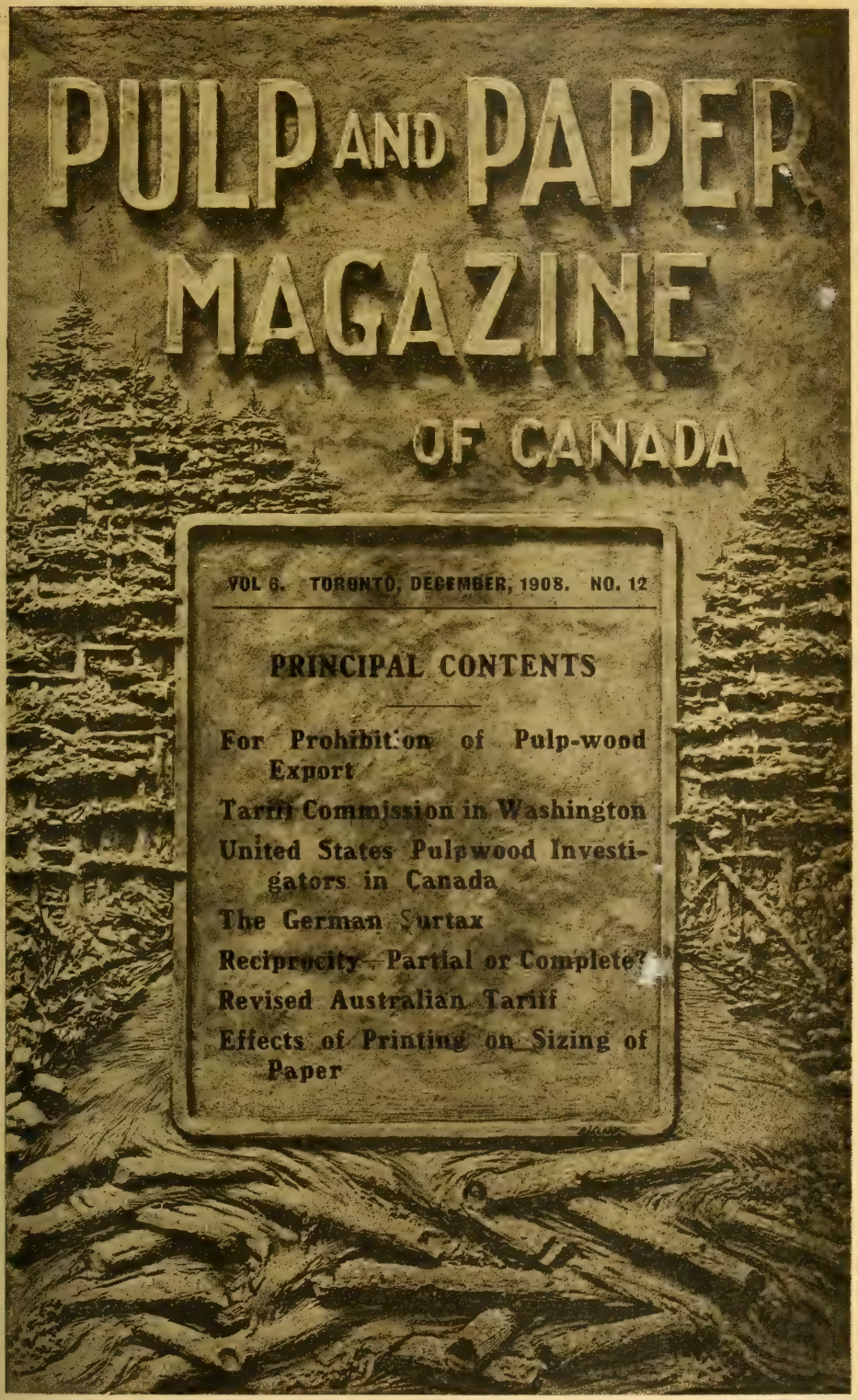

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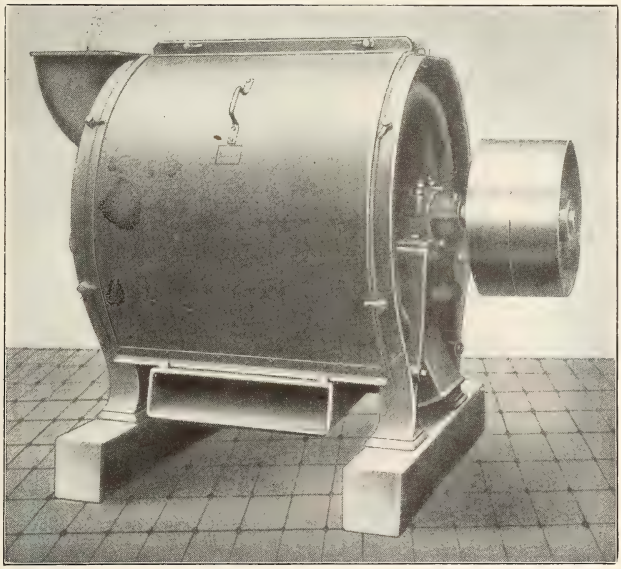

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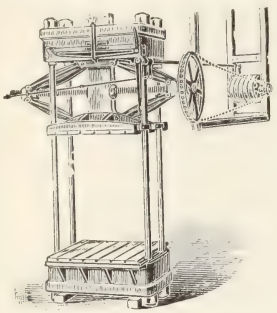

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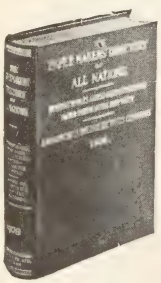

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Alphabetically Arranged. *Printed in Clear Type.*

——— CONTENTS INCLUDE ———

Paper, Pulp, and Board Mills.— Names and Addresses of more than 5,000 in 40 different Countries, with (1) Makes of Paper; (2) Number and Width of Machines; (3) Tonnage Output; (4) Power Used; (5) Telegraphic Addresses; (6) Agents, &c.

Classified Lists of Principal Productions for each country.

Special Buyers' Guide.

Paper Agents and Mill Representatives (with Mills Represented).

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Wholesale Stationers and Paper Merchants.

Waste Paper Merchants, Rag Merchants, and Paper Stock Dealers

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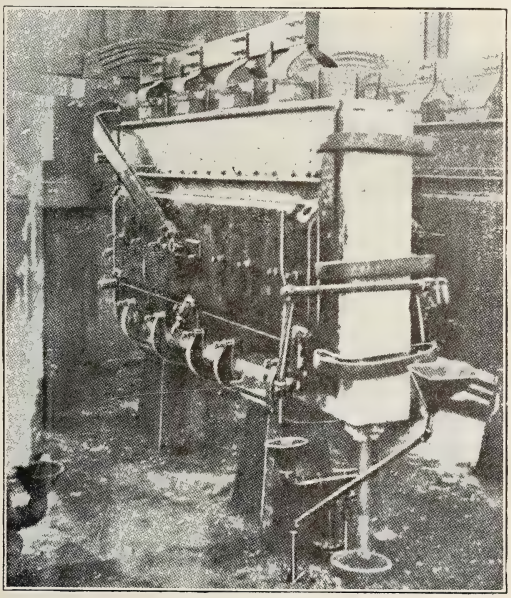

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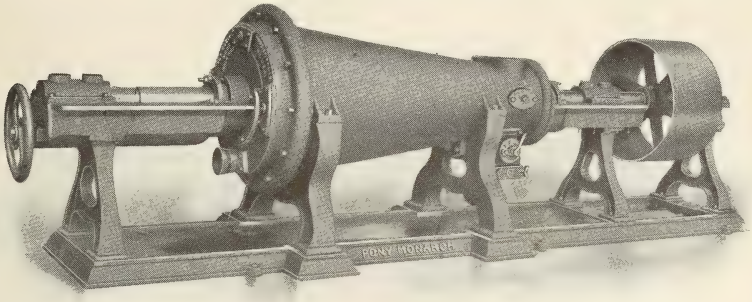

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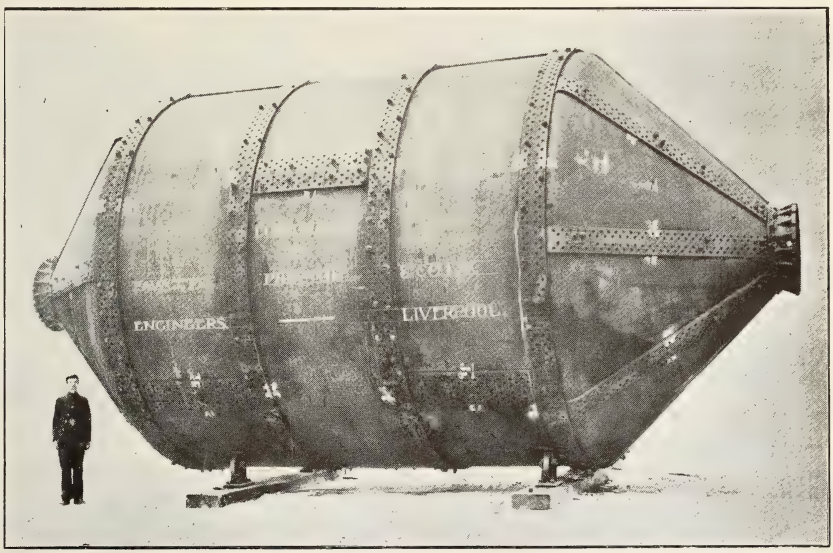

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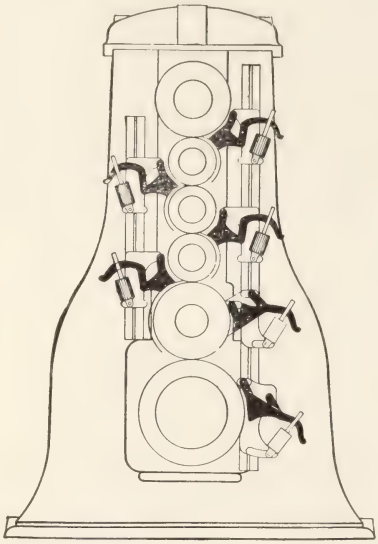

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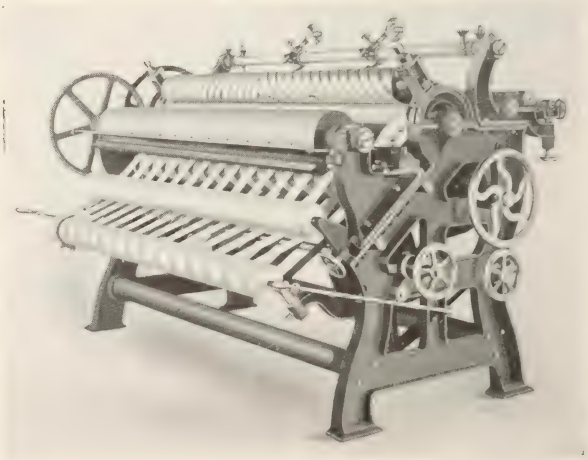

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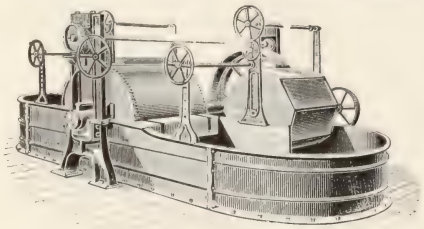

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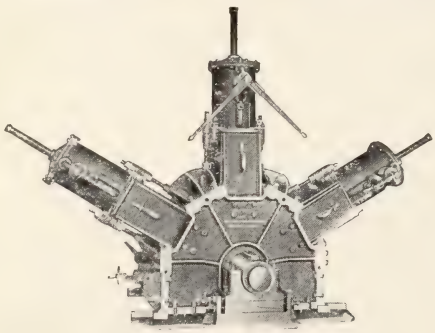
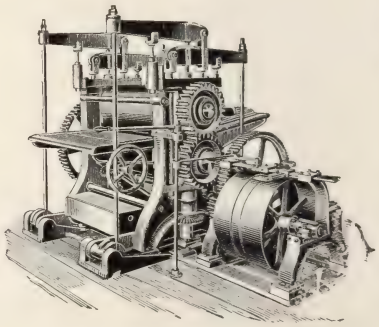


Patent Improved Wood Pulp Grinder.



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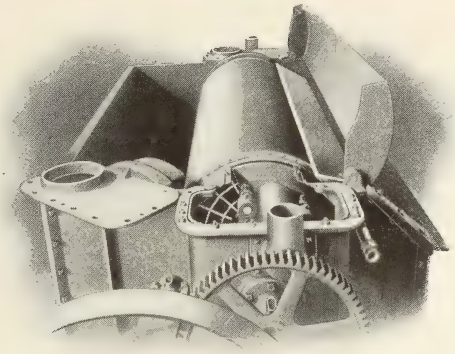

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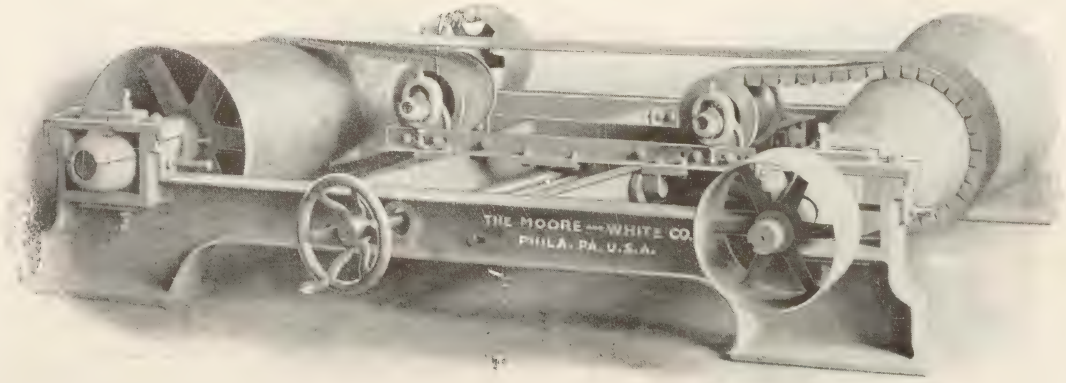

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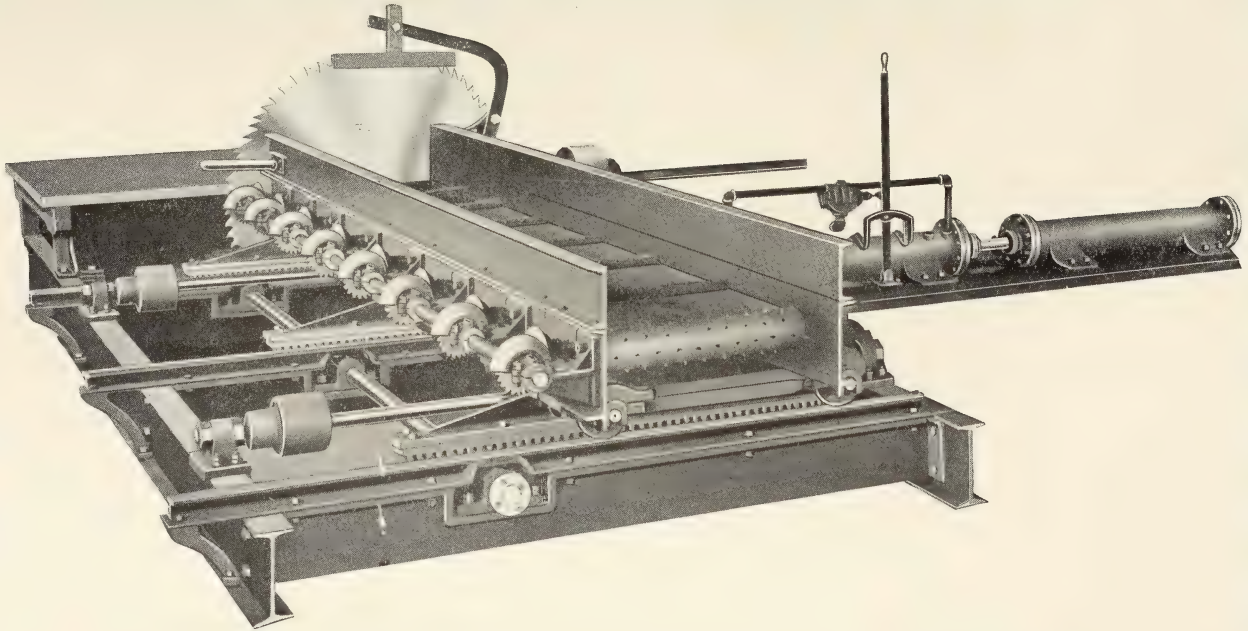

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THE
PULP AND PAPER MAGAZINE OF CANADA

Vol. 6.—No. 12. TORONTO, DECEMBER, 1908. $1 A YEAR / SINGLE COP. 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

SUBSCRIPTIONS: Canada and British Empire, $1.00 per year United States and Foreign, on account of postage $1.50 per year.

The Pulp and Paper Magazine is published on the second Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 1st of the month. and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

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FOR PROHIBITION OF PULP-WOOD EXPORT.

The Miramichi district of New Brunswick is one from which so much forest wealth is shipped away to a foreign country in an only partially worked up condition that it is not surprising that the movement for restricting or prohibiting the export of pulp-wood grows in strength. It is stated that during the present year that parties controlled by the International Paper Co. have cut and shipped about 50,000,000 feet of lumber, most of it in the shape of pulp-wood. Suppose that only half of this had been shipped as rossed pulp-wood, or, say, 50,000 cords, it is a loss to the Province and to Canada of over three-quarters of a million dollars per year. This is reckoning the value of pulp-wood at $6 per cord and of pulp at $22 per ton. If the same pulp were worked up into paper the difference would, of course, amount to a very much greater loss. And this represents the operations of only one concern, in only one district of the Dominion. Moreover, the company in question has recently taken over several additional timber tracts, which makes the matter all the more pressing.

The Liberals of Northumberland county, impelled by these arguments of self-interest and for the conservation of the country's resources, have now placed themselves on record as being opposed to the exportation of pulp-wood altogether. What is more, under the leadership of an able advocate in the person of Hon. Mr. Burchill, they mean to press the matter upon the immediate attention of the Government.

UNITED STATES PULP-WOOD INVESTIGATORS IN CANADA.

The report of the opinions formed by the visit to Canada last month of the three members of the special committee appointed by the United States Congress last April to enquire into the pulp-wood and paper question will be watched

for with great interest. The members were James R. Mann, of Chicago; W. H. Stafford, of Milwaukee, and W. H. Ryan, of Buffalo, accompanied by C. C. Steinbeck, of Chicago, the secretary of the committee. The representatives had a talk with Sir James Whitney and Hon. Frank Cochrane, and much of the Department's information regarding Ontario forests was placed at their disposal. In the afternoon Prof. Fernow, Dean of the Faculty of Forestry at the university, was seen, as well as a number of others.

The immediate object of the committee is to find out whether there is a sufficiency of raw material in the United States or on the continent to insure the supply of paper for all time to come; that is, provided proper forestation measures were adopted. They desire to gain first-hand knowledge of Canada's wealth in this regard. With this object in view they conducted personal enquiries in the woods of Northern and North-western Ontario. They will thus be able to report as to what they have seen instead of merely what they have heard. They have already made personal investigations in many States of the Union, spending many days in the woods, as well as taking a lot of evidence, so that they will be in a position to speak with some authority when their investigations are concluded. Their opinions will go a long way towards making any new tariff arrangements by the Washington Government affecting the pulp and paper industry.

THE GERMAN SURTAX.

The press of Germany acknowledges that the surtax placed by the Canadian Government on goods coming from that country has effected serious damage on trade, and it welcomes the recent formation of an economic association having for its object the furtherance of commercial relations between the two countries. Is it not time also that we in this country should reconsider our own position in this matter? The object of the surtax has already been obtained. In a way, it was not of our seeking; its primary purpose was to show Germany that she could not with impunity interfere in the domestic relations existing between Canada and the Empire. Germany has now learned her lesson, and it would do neither that country nor this any harm to remove the barriers which prevent profitable trading between the two. Canada has in essence nothing but good feeling for German business men; in fact, it is not saying too much in their favor to remark that for integrity and fair dealing they set a particularly good example. Furthermore, we need several lines of goods which are made exclusively, or at any rate mostly, in Germany, such as lining and tissue papers and other articles of a special character. Another reason calling for the abrogation of the German surtax is that in a measure it not only fails in its purpose, but places a premium on fraud. For there is little doubt but that considerable quantities of German manufactures come to Canada by way of Great Britain, and, indeed are entered under the preferential rate of duty. On our own side there are several farm products which we could profitably export to Germany, but which, owing to artificial barriers, we do not. We believe there is a feeling among the public of both countries that this tariff war has lasted long enough, and that it will do no harm to bring it to an end.

RECIPROCITY—PARTIAL OR COMPLETE?

In an address before the New York Chamber of Commerce last month James J. Hill, president of the Great Northern Railway, took as his subject the commercial relations of the United States and Canada. While directed to the practical object of trade Mr. Hill's address was illuminated with touches of genuine eloquence in dealing with the social and moral relations of the two peoples. He pointed out that while half of the population that was now carrying new life into the Canadian North-West came from the States, about 1,200,000 of the inhabitants of the American Union owed their birth to Canada, where he himself was born. "Geography, ethnology and all the great, silent, natural forces are drawing us closer all the time. * * * The world grows smaller in the separateness of its people and greater in its possibilities of united action every day. With the sunlight of this era upon our faces let the two peoples whose ties of blood and capacity for self-government and material achievement have knit so closely, oppose a nobler manhood and a larger statesmanship to the policy of estrangement and jealousy that has been permitted to guide their fortunes." He concluded with a plea for unhampered trade from the arctic circle to the Gulf of Mexico.

The sentiment of friendly regard and the extension of mutual trade can both meet with a warm response from Canadians. The conception of a whole continent of free trade is a grand one, and it is to the great credit of the American people that such wishes are no longer coupled with the covert threat or the aggrandizing desire to pull this country into a political union which would choke the aspirations it has had towards nationhood since Confederation. There seems to be more of mutual respect which augurs well for the future relations of the two peoples. Making due allowance for this happy change in sentiment, there still remained the problem of reconciling the fiscal differences of the two countries in such a scheme of continental free trade. We therefore wrote Mr. Hill asking how he would frame a mutually acceptable tariff. Would he propose that each country retain its present tariff against the outside world, but take down the customs barriers between each other? If so, we did not see how he could get the people of the United States to listen to such a proposition. Under our present tariff, so much lower on the average than theirs, the import trade would soon shift from United States importing centres into Canadian cities. On the other hand if he proposed that Canada should raise its tariff to the level of that of the United States he would involve this country in the predicament of extinguishing at once the preference in favor of Great Britain, which is now the settled policy of the Government, inaugurating a tariff of such extremes as even protectionists here have never proposed.

Mr. Hill replied as follows:—"I beg to acknowledge receipt of and thank you for your favor of the twentieth instant. My present proposition would be to abolish all customs on the natural products of both countries, that is, the products of the farm, the forest, and the mine, leaving all manufactured and other articles to be dealt with as occasion might seem best for both countries. My desire was to put before the people of

the United States in a brief way the main facts and to show the immense benefit that would come to both countries through closer commercial relations.

Yours truly,

Jas. J. Hill."

If each country mantained its own tariff we should still require customs houses on our borders, otherwise the importing trade would soon drift into Canadian channels, while United States manufacturers in many lines would quickly swamp the Canadian industries. But taking what are commonly called raw materials—such as products of the farm, forest and mine—we should judge that the exchange would on the whole be equitable, though the possession of Canadian wheat would give the United States miller the chance of fortifying himself in the lead he now holds as an exporter of flour. In coal and some other minerals the exchange would be beneficial, because Ontario needs anthracite coal from Pennsylvania and New England would be the chief consumer of Nova Scotia soft coal if it were not for the present tariffs.

When we come to the forest products the exchange would not be so equitable, and judged from the Canadian standpoint Mr. Hill himself brings in evidence against his position in the following quotation he makes from D. M. Parry, late president of the American Manufacturers' Association:

"The Canadian trade is more important than all the commerce anticipated for the Panama Canal, and yet our tariff policy in respect to Canada could hardly be worse had it been dictated by a foreign enemy. As for the tariff on raw materials, why should this country be so anxious to exhaust its own mineral wealth and denude its forests that it should bar these products from other countries?"

Another witness quoted by Mr. Hill confirms Mr. Parry's plea for self-preservation at his neighbor's expense:

"Only last year a big lumber manufacturer of Saginaw, Mich., representative of an industry once hostile to reciprocity, but so no longer, wrote these words in the annals of the American Academy for the Advancement of Political and Social Science:

"As a manufacturer, as an employer of labor, and as one who has been in the lumber business all his life, and is now engaged in it, as an owner of forests and timber lands and saw mills, I cannot see wherein the government of the United States is not making a great mistake in maintaining this tariff upon rough lumber, taxing our home industries for their raw material and offering premium for the destruction of our present forest area."

In other words, having realized that the forests of a country, unlike a crop of grain, require a generation or more and not a season to restore, and having desolated their own forests to such an extent that their home industries can no longer be maintained upon them, these advocates of partial reciprocity are willing to reciprocate if we will allow them to do unto our forests as they have done unto their own. If the destruction of the forests is a calamity to the United States—which its wisest statesmen realize—how is it a blessing to Canada? The parable of ten virgins that were wise and ten that were foolish comes to mind, but this parable is only of partial application, because the ten Canadian virgins are in reality no wiser than the other ten, only they have some oil—just

barely enough—in their own lamps still. While they must humbly acknowledge that it is by no prevision of their own that they are still in possession of this oil they will see that if they shorten their own supply the whole twenty will be left without light.

Taking the item of forest products, and perceiving how inseparable those assets are from a variety of industries of prime importance to this country, it will strike the average man that any scheme of reciprocity to be fair to the people on both sides of the line must go beyond the products of the farm, forest and mine. That freer trade between the two countries will be of advantage to both no unprejudiced person can doubt.

THE TARIFF COMMISSION IN WASHINGTON.

The Ways and Means Committee in Washington have been engaged during the last three weeks in taking evidence on the pulp and paper question. A witness who spoke at considerable length was John Norris, chairman of the American Newspaper Publishers' Association, who stated that he wanted free pulp, free paper and reciprocity with Canada for free pulpwood, free paper and free pulp.

David S. Cowles, ex-president of the American Pulp and Paper Association, took the position that no industry should single out another for destruction, no matter how powerful it might be. While the demand for free pulp and free paper had been made upon the grounds that there is an illegal combination and that it was necessary to conserve our forests, he claimed that both contentions were erroneous; also to remember that the manufacture of news print is based very largely upon water power. He added that there was another danger, that of the invasion of English capital, which was willing to work for much less remuneration than manufacturers could take in the United States, as it was capital that had lain dormant for many years. Asked by Mr. Underwood as to whether the introduction of free trade would close out the International, he stated it would wipe out a large percentage of its capital, and it would build mills in Canada. Free pulp and paper would soon terminate the manufacture of news paper in his locality; it would destroy all existing plants.

Evidence was put forward to show the considerably greater cheapness with which paper could be manufactured in Canada than in the United States, the comparison showing lower wages, smaller cost of raw material, etc.

—Before another number of the "Pulp and Paper Magazine" appears our readers will be dating their letters 1909. In wishing our friends a right Merry Christmas and a Happy New Year, we desire to thank them for their increasing interest in the "Magazine," and for the support and encouragement they have given to the campaign of education regarding the forestry problem. The pulp and paper manufacturers have taken a statesmanlike view of this problem, and have realized that the maintenance of our forest resources is one of the first duties we owe to the nation, since the perpetuation of this great asset means the salvation of our great water-powers and agricultural resources, not to speak

of the pulp and paper industries whose future is absolutely controlled by the forest. Our friends can go on hopefully in educating their fellow citizens in this cause, knowing that success will not only secure the permanence of the interests in which they themselves are engaged, but will preserve those inestimable resources given to us in such abundance by a special providence, which resources if wasted, will bring upon Canada the desolation that has overtaken so many improvident nations of the past. We all need in our hearts that righteousness which exalteth a nation in order that we may rise to a view beyond the selfish interests of our own generation. In fact no man can appreciate the problem of the forest unless he realizes the effect of his own acts upon posterity. Hence there is an appropriateness in confronting ourselves with the judgment of unborn generations of Canadians when we come to the anniversary of Him who taught that the concerns of futurity are the first problems of the present.

THE LATE SIR H. JOLY DE LOTBINIERE.

In the death of Sir Henri Joly de Lotbiniere Canada loses a public man of outstanding fine character and integrity, and forestry loses one of its earliest and ablest advocates. He has, in fact, been called the father of Canadian forestry, for he was one of the first to draw public attention to the supreme necessity for conserving the country's forest wealth. Not only this but Sir Henri and his son have made extensive experiments on the seigneury near Quebec, planting various trees, making tests as to their value for growing and lumbering purposes, etc. Sir Henri was a native of France and of Hugenot descent. He was called to the Quebec Bar in 1855, and was elected to the Parliament of Lower Canada as a Liberal in 1861. He became Premier of Quebec Province in 1878. In 1900 he was appointed Lieutenant-Governor of British Columbia, which position he held with conspicuous success until 1906. His death last month is regretted by all parties in every part of the Dominion.

—H. B. Donovan, of the Canada Paper Company was again a large prize-winner in poultry at the Guelph Winter Fair. It is good to have a scientific or industrial hobby outside of one's daily business, and Mr. Donovan has become as expert in raising birds as he is in judging paper.

—T. J. Marshall & Co., the old-established firm of paper mill engineers, makers of Dandy rolls, etc., London, Eng., have, we understand for family reasons, converted their business into a limited liability company. The management of the business will remain in the same hands as heretofore.

—The Black-Clawson Co., Hamilton, Ohio, builders of paper and pulp mill machinery, are installing additional equipment at their factory in order to meet the increasing number of orders for machines which they are receiving from all parts of the country.

—The arrival recently in Great Britain of a cargo of 5,000 tons of mechanical wood pulp from Clarke City having been described as the largest ever sent from Canada, it may be stated that this is not so, as Becker & Co. shipped per Manchester Engineer from Chicoutimi to Manchester some 6,300 tons in 1902. This year the Nordamerika, from Montreal, brought an entire cargo, comprising 21,200 bales wet and 12,158 bales dry wood pulp to Manchester, being chartered by A. Wertheim & Co., Hamburg. The same vessel also brought over 4,450 tons from Chicoutimi to Queensboro.

PULP AND PAPER NEWS

The Quebec Government will establish a school of forestry for that province.

* * *

The Port Burwell Weekly newspaper has been burned out, following an explosion of gasoline.

* * *

The Miramichi Lumber Co.'s lower rossing mill at Chatham, N.B., has closed for the season.

* * *

The New Brunswick Government has passed regulations prohibiting the cutting of timber of less than nine inches in diameter at top. This is an important move in the direction of preserving the Province's timber resources.

* * *

The E. B. Eddy Company, Hull, P.Q., have purchased the Laporte-Martin block in Montreal, upon which they will build a large and up-to-date warehouse in place of the one they now occupy.

* * *

Some anxiety is being felt at time of going to press as to the whereabouts of the steamship "Kristiana," which was last seen at Forteau Bay, and which was on her way to Seven Islands, Que., to load a cargo of pulp for Great Britain.

* * *

The British American Typewriter Company, Limited, Toronto, capital $10,000, has been incorporated to manufacture and deal in writing machines and supplies, stationery, books, etc. T. Rigby, 207 Victoria St., Toronto, is one of the provisional directors.

* * * *

The Inglewood Pulp Company's two cut-up mills at Musquash, N.B., controlled by the St. John Pulp and Paper Company, Mispec, N.B., and having a capacity of some 150,000 feet per day, have been destroyed by fire with a loss of $22,000, insured for $13,000.

* * *

The Bay Shore Lumber Co., St. John, N.B., expect to export in the spring between 15,000,000 and 16,000,000 feet of pulp-wood for New Brunswick to their mills in Maine. They recently launched at Great Salmon River two barges for carrying pulp-wood.

* * *

The Pembroke Standard, Limited, Pembroke, Ont., capital $20,000, has been organized to take over the printing business of W. D. McLaren, publish a newspaper in Pembroke, and carry on a stationery and paper business, etc. G. V. White and Alex. Morris, of Pembroke, are charter members.

* * *

We are glad to note that J. A. De Cew, chemical engineer, Montreal, has been elected a member of the American Institute of Chemical Engineers. This organization is one which demands very strict qualifications as to membership so that his election is a distinct compliment to Mr. De Cew.

* * *

Victoria Paper and Twine Company, Limited, Toronto, has been incorporated, capital $80,000. It will buy and sell paper, pulp, woodenware and cordage, and will acquire the business carried on by the Hubbs and Howe Company, selling agents for the Montrose Paper Company, at 46 Colborne Street, Toronto.

* * *

A new building for the teaching of forestry and botany in connection with the University of Toronto was opened last month with an informal reception by Professor and Mrs. B. E. Fernow and Professor and Mrs. J. H. Faull. Professor Fernow, as our readers know, is dean of the forestry faculty, while Professor Faull's specialty is botany.

* * *

Ezra B. Wigle, formerly of Windsor, Ont., has been appointed manager of the business of F. W. Bird and Sons., manufacturers of roofing and building paper, Hamilton, in succession to the late W. R. Hardy, whose death was referred to in last issue. Mr. Wigle had been managing the western branch of the firm's business at Winnipeg, and his place at the latter city will be taken by A. C. Baker, of Windsor.

John C. Stewart had a narrow escape from death by being thrown off one of the block-wood conveyors at the Miramichi Lumber Co.'s mill, Chatham, N.B. He was struck by a block and thrown over the side of the conveyor, a distance of twenty-five feet from the ground, rolled down over the pile of rossed wood, and was picked up on the wharf in an unconscious state.

* * *

The Wm. Hamilton Manufacturing Company, Limited, Peterborough, has been reorganized under the name of the William Hamilton Company, Limited. The president is Andrew McFarlane, who was well known throughout the Dominion as the superintendent of the old company, while among the directors are Geo. G. Gladman, W. H. Collier, J. C. Smith, David Spence, L. A. Potvin, and C. R. Cameron. Special attention will be devoted to sawmill machinery.

* * *

Baie St. Paul Lumber Co., Limited, capital stock of $175,000, headquarters at Baie St. Paul, Que., has been incorporated to manufacture and deal in lumber, bark, wood, pulp, pulp wood and the products thereof. The charter members are: John B. Coughlin, White Lake Corners, N.Y., and F. K. Kernan, of Utica, N.Y.; C. E. Taschereau; J. Phileas Cantin, and L. A. Cannon, all of Quebec. The company has taken over large timber tracts near Beaupré.

* * *

The Champoux Co., of Disraeli, Que., is bringing an action for $2,500 against the Brompton Pulp and Paper Co. as defendant. The Champoux Co. contracted to deliver to defendants pulpwood estimated at between 8,000 and 10,000 cords, the price agreed upon being $5 per cord for the rough wood and $6 for rossed. It contends it delivered about 10,000 cords, all of which was measured on the cars at Disraeli, while defendants maintain that there was a deficiency to the extent of $2,500.

A decision has been handed down in the Appellate Court in Rochester, N.Y., affirming the judgment in the case of Onderkirk and Snyder, Herkimer, N.Y., against the Bayless Pulp and Lumber Company, to recover the capital stock of the Ste. Anne Power Company, and the Beaupre Power Company, which owned valuable stumpage rights on some 300 square miles on the Ste. Anne River, a few miles from Quebec. The Bayless Company purchased this property in August, 1905, for the purpose of ultimately erecting a paper mill thereon, and also for the timber, which was considered very valuable. There are also valuable water powers and privileges on the property and its estimated value appears to be nearly a million dollars. The plaintiffs brought the action to recover the property and stock in question, claiming that when the Bayless Company purchased it, they had knowledge of an outstanding option which had been given the plaintiffs by the former owner and had not expired when the Bayless Company made their purchase. The decision affirms a complete victory for the Bayless Company which operates a large wrapping paper mill near Binghampton, N.Y.

—The Christmas issue of the "Farmers' Advocate and Home Magazine," published in London, Ont., is, as is usual with our enterprising contemporary, a very fine special number. Besides the usual fine array of articles teaching the farmer how to improve his practice and his surroundings, Dr. B. E. Fernow, Dean of the Forestry Department of Toronto University, makes a wide survey of the timber situation in Canada. more particularly from the farmer's standpoint. The cover of the Christmas issue, too, represents a beautiful woodland scene in three colors. There is also the initial chapter of what promises to be a very interesting new serial by Walter Kirby, called "The Golden Dog."

NEWS OF THE MILLS

W. G. Tierney, of Merritton, Ont., has been appointed manager of the Cataract Power Co.'s mill at Clarke City, Que.

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In spite of reports to the contrary, the Sault Ste. Marie Pulp and Paper Co.'s pulp mill at the Soo is running full time.

* * *

The Laurentide Paper Co.'s paper mill at Grand Mere, Que., is now running again as usual, the strike having been settled.

* * *

The Nicolet Falls Pulp Mills at Nicolet Falls, P.Q., owned by A. J. Morrill, have now been taken over by the Nicolet Falls Pulp and Lumber Co.

* * *

R. N. Calkins, of Vancouver, representing English capital, is said to be making arrangements for the establishment of a $350,000 pulp mill at Powell River, B.C.

* * *

The Canadian Pacific Sulphite Pulp Co.'s mill at Swanson Bay, B.C., is now nearly completed, and by next spring the company expects to be making at least twenty-five tons of pulp per day.

* * *

F. J. D. Barnjum, of St. Anne's N.S., expects to have his pulp mill in northern Cape Breton in operation within the next month or so. Employment will be given at the start to about 400 men.

* * *

Owing to the overheating of a shaft in the E. B. Eddy Company's paper mill at Hull, Que., there was a slight fire, or rather a good deal of smoke, the other day. But the cause of the trouble was removed before any damage was done.

* * *

The Gordon Pulp and Paper Co., Limited, Dryden, Ont., have given an order with the Stebbins Engineering and Manufacturing Co., Watertown, N.Y., for the entire equipment required for its forty-ton sulphite plant now under construction.

* * *

The Bagley and Sewall Co., Watertown, N.Y., are making the last shipment of paper mill machinery ordered by the Anglo-Newfoundland Development Co. for its mills at Grand Falls, Nfld., including two large Fourdriniers.

* * *

Two new beaters are being put in at the Riordon Paper Mill, Merritton. At the company's mills at Hawkesbury a number of new Decker screens were recently installed, and as a result they are now turning out sulphite pulp of especial fineness.

* * *

The Brompton Pulp and Paper Co., Bromptonville, P.Q., have a large gang of men at work hauling pulp-wood out of the river between East Angus and Ascot Corner, fully $75,000 worth having been tied up in that district owing to the bad water flow.

* * *

The Willow River Timber Company, Limited, capitalized at $250,000, proposes to establish saw and pulp mills in British Columbia, and have already, it is said, purchased over 33,000 acres of spruce land along the Willow River. Among those interested is J. H. Spence, 44 King Street West, Toronto.

* * *

Water in the Ottawa Valley has fallen to such a low ebb that Ottawa city council was compelled to ask J. R. Booth and the E. B. Eddy Co. to further curtail their operations so as to leave sufficient water pressure for domestic and fire protection purposes. Only about 10 per cent. of the usual load has been available for some time past.

* * *

A company has been formed in London under the name of the British Pulp Co. of Newfoundland, Limited, with an authorized capital of £300,000 in £1 shares. It has power to take over the

estates of J. J. Murphy, and to operate pulp and paper mills, etc. W. C. Powers, 180 Fleet Street, London, E.C., and J. P. Simpson, 4 New Court, London, W.C., are among the directors.

* * *

The Colonial Wood Products Co., Niagara Falls, N.Y., is now preparing to build its proposed pulp mill in Thorold, Ont. It will be situate on the old fair ground, and ground has already been broken for a new railway switch. The Thorold council will next month submit a by-law to grant the company a fixed assessment of $2,500 for ten years, besides other privileges. The prime mover in the new company is H. B. Eshelman, of Niagara Falls, N.Y.

* * *

A deal has been completed at Philadelphia, whereby the control of the $40,000,000 Lake Superior Corporation passes from Philadelphia financial institutions to interests represented jointly by New York and Philadelphia parties. President Lloyd, of the Commercial Trust of Philadelphia, completed the negotiations, paying for the bonds of the corporation held by Philadelphia institutions. The securities referred to were given in respect of loans to the Canadian Improvement Company to the amount of between $1,500,000 and $2,000,000. The Canadian Improvement Co. defaulted a year ago, and the banks which made the loan foreclosed. The banks are now realizing on the securities and about $5,000,000 out of the $40,000,000 of the capital is involved. The control of the Lake Superior Corporation is affected only to that extent.

* * *

The Anglo-Newfoundland Development Company, through George F. Hardy, the well-known engineer, of New York, have awarded the contract for heating the buildings, now under construction at Grand Falls, to the American Blower Company, of Detroit, Mich. Shipments from the factory are now being made. The four sets of apparatus, each consisting of steel plate fan with direct connected engine and heater, have a combined capacity of delivering into the various buildings 267,000 cubic feet of heated air per minute, a total of 13,827 square feet of cast iron indirect radiation being required for heating the air to the proper temperature, and about 25 tons of galvanized steel sheets are required to manufacture the ducts and flues for properly distributing the air. American Blower Company's Eastern sales offices are at 141 Broadway, New York.

* * *

The Fort Frances "Times" says: "Work on the power dam and paper mill is progressing favorably, over 300 men now being employed on both sides of the river. A large force of men are at work tearing down the old coffer dam erected by Maguire & Penniman two years ago. Another gang are digging and clearing for the south wall on the American side, and the big cable and derricks are running briskly. The whole look of the place has assumed a busy aspect, and one looking on would imagine there were more men employed than really are. One thing in particular also is noticed, that being the almost total absence of Italians or any other foreigners, none but skilled workmen being employed." We may state that the manager of the Minnesota and Ontario Power Co., which is doing this work, is Warren Curtis. That company has absorbed the Rainy River Improvement Co., will build the International bridge between Fort Frances and International Falls, and will obtain connection with the Canadian Northern Railway, whereby all trains to and from St. Paul and Minneapolis will run into the C.N.R. It is stated that the paper mill will begin operations within eighteen months.

—It was announced recently by F. Becker in London that he had just booked an order for Scandinavian ground wood pulp for shipment to the United States. This he regarded as a sign of the times, as there had been several other enquiries in the same direction.

MANAGEMENT OF WIRES AND FELTS.

Much diversity of opinion exists among machine men regarding the proper tension to carry on a new wire, but the majority agree that the weight of the stretch rolls should be sufficient, says a writer in "Paper Trade Journal." A few machine men believe in putting the roll down hard on a new wire, their idea being to fit the wire to the machine. This practice is wrong and not at all plausible, for before leaving the wire mill the wire receives a treatment that is supposed to make it perfect as far as fitting the machine is concerned, and stretching it on the machine is unnecessary. The least possible tension should be used upon a wire at all times, for every time it is applied it only tends to weaken the wire by the strain placed upon it. Machine men have several excuses for putting down the stretch roll. Slack edges on the wire, ridges, crushing at the couch rolls are all somewhat benefited by tightening the wire, consequently every time the machine man has trouble from these sources his first remedy is to tighten the wire, and that for one thing is why wires do not last as long as they should.

There are other ways of overcoming such troubles, and should the machine man use them more frequently wires would surely show longer runs. Slack edges on the wire are caused mainly by neglect; when starting the machine some of the paper usually finds its way to the stretch roll and sticks to its surface on the inside of the wire, and by so doing causes a slack edge on the wire. There is only one way of making that edge tight again, and it is to scour the whole wire with vitriol and then tighten it so the slack edge will be taken up. When this happens to a wire two or three times the life of the wire is shortened at least 25 per cent. Crushing of the paper at the couch rolls may be stopped by using less weight upon the rolls, as very often more weight than is necessary is carried upon the rolls. Imperfect vacuum is another cause for crushed paper, and can be easily remedied. The machine man neglects these little things and will apply the tightened wire remedy, without even trying any other, and many a good wire lasts but three-quarters as long as it should. Many are of the opinion that the friction caused by the passing of the wire over the suction boxes has much to do with its wear and durability, but experience has proven that such friction has very little to do with the life of the wire. It was first proven when wooden covers for the suction boxes were put in use. The wood being softer than the brass plates in use, it naturally followed that the friction would be less damaging to the wire, but with the wood covers wires last no longer than they did with the brass ones.

At the present time we hear very much talk about revolving suction boxes, and what they will accomplish when perfected. The writer knows of one mill which has one machine equipped with revolving boxes, and while they have done much toward making easy the making of heavy paper, they have not increased the life of the wire one bit over what it was with the stationary boxes; therefore, it may be safely asserted that the suction boxes have very little to do with the life of a wire. The chemicals used in the manufacture of the paper are the most influential in shortening the life of the wire; next may be mentioned the accumulation of dirt or size in the meshes of the wire; then neglect of the wire by the machine man and his putting needless strain upon it by tightening it at divers times, when he could avoid doing so by overcoming his difficulty in some other manner. The importance of keeping the wire clean cannot be put too strongly. Besides giving it longer life, the paper manufactured will be better and free from little defects that can be caused by a dirtier wire. The manner of keeping it clean is by very fine and powerful showers of clean water coming

from pipes which may be located as follows: One after the bottom couch roll, the next one over the stretch roll, and one just before the breast roll. If the small holes in these shower pipes are kept perfectly clean, and a strong shower of water is maintained, the use of vitriol to clean the wire may be avoided, and the results obtained will surprise the most sceptical.

The wet felt, or as it is usually called, the first fet on the machine, is subject to many conditions. Its lasting power depends a good lot upon the man running the machine, just as the wire does. Keeping felt clean does much towards getting best results. The rolls upon which the felt travels should be in A1 condition and so crowned as to aid in keeping the seam of the felt straight. A machine man can show his carelessness in no better way than to allow the felt to run with a twisted seam. Very few machine tenders realize the importance of keeping the seams of the felt as straight as possible; it increases the efficiency of the felt in many ways, as it guarantees a uniform open felt web and a uniform pressure of the paper. Since the introduction of bottom rubber press rolls the washing of felts on the machine has been made much easier and more beneficial. It is now possible to run a first felt until it is completely worn, without removing it from the machine for washing. The washing of these felts on the machine is accomplished by roping them, and allowing the pressure of the top roll to squeeze the dirt and filling from them. If this method was attempted with the brass bottom rolls, the felt would be cut into shreds. Notwithstanding this method of washing a first felt they should be given a liberal dose of the prepared soap which is now on the market, as it preserves their softness and durability. Many machine men fail to pay the proper attention to felts, and when one becomes a little dirty it remains unnoticed until it begins to mark the paper, and only then does the machine man realize that felts are a part of paper making.

NON-STRETCHING PAPER FOR COLORS.

In the "Wochenblatt fur Papierfabrikation" two paper makers give their views on the manufacture of non-stretching papers for multi-color work. Very hygroscopic papers give the printer much trouble. The printing qualities of the paper are adversely affected by excessive calendering and too much starch.

In the opinion of one of the writers, the sheets should be cut with their shorter sides in the cross direction of the webb and their long sides in the machine direction, because the percentage stretch is always greater in the cross direction. This writer has also observed that papers made on wide machines always stretch more than papers made in narrow widths from the same stuff. The tensions on the paper during making and drying must not be greater than is absolutely necessary. The paper should be first glazed in the reel form, and afterward cut into sheets and glazed in a sheet supercalender. The sheets are passed through first in the cross direction of the web, and then diagonally from both corners. In this way the stretch is taken out of them as far as possible in all directions. The stretching qualities of a paper are estimated by cutting strips from the two directions of the sheet, measuring them, immersing in water for ten minutes, and measuring them again, after rapidly removing the excess of water by blotting paper. This writer considers that the working of a narrow web on the machine is the most important point in making this kind of paper, while the other paper maker, Herr Postl, does not consider it to be of much account, provided the sheets are calendered alternately in the two directions.

Herr Postl states that if the composition and beating of the stuff be correct for a multi-color printing paper, the next most important point is the treatment during drying. The non-stretching qualities are imparted to the paper by repeated pressure in the wet state, not

only by the wet presses but also by press rolls pressing the paper against the drying cylinders. In this way the fibres are, so to speak, kneaded together, and the stretch is taken out of the paper before the fibres are fixed. In the ordinary way the exit of steam from the paper during drying loosens its structure, and deprives it of its non-stretching qualities. This is best prevented by having a number of press rolls on the drying cylinders, which compact the paper as it dries. If these press rolls be not available, a similar effect, in a less satisfactory degree, may be obtained by the ordinary smoothing rolls situated between the drying cylinders, the drying felts being stretched as tightly as possible. Herr Postl contends that if the moist pressure during the drying and fixing of the paper be very considerably greater than the moist pressure during printing, the paper will not stretch during the latter process.

SOLID PARTICLES IN THE HOLLANDER.

Lumps of undissolved dye, if they get into the hollander, produce a mottled pulp, which is practically valueless. It is conceivable that a uniformly mottled pulp might be used for certain classes of paper, but such a pulp cannot be expected to result from the haphazard occurrence of undissolved dye in the dye dissolving vat. To prevent undissolved dye from reaching the hollander the arrangement now to be described is the best yet devised. The dissolving vat is jacketted so that its contents may be heated by exhaust steam, and it is provided with a mechanical stirrer to ensure the most intimate contact possible between the water and the solid dyestuff. The outlet pipe which transports the dye solution to the hollander must not be too near the bottom of the dissolving vat, thereby allowing sufficient space between its orifice and the vat bottom to receive dye particles which have escaped solution in spite of the stirring, and which, therefore, sink through the liquid. At the same time the opening of the outlet pipe into the dye vat must be provided with a strainer. This may seem a superfluous accessory, if a perforated false bottom is put just below the stirrer. The theory of this false bottom is that the undissolved particles sink under it, and that it protects them from the raising action of the stirrer. There is no doubt that it does so once they are below it, but the action of the stirrer prevents them from sinking down to the false bottom as it should do to secure the full dissolving action of the water, and may sweep them against the mouth of the outlet pipe. In fact, the advantage of such a perforated false bottom, if the outlet pipe is not too near the bottom of the vat, is imaginary. Another equally useless idea is to assist the solution of the dye by adding acetic acid to the water employed for solution. If the mechanical precautions above detailed are taken the use of acetic acid is quite unnecessary, and is, in fact, merely a source of unremunerative expense. It may be mentioned that the most care as regards dye dissolving is required when magenta dyes are in use. They are by no means freely soluble in water.

Sand and other gritty particles occur in pulp, and result, for example, from the wear of the grindstones used in various stages of its preparation. Sulphite pulp is particularly liable to contain very sharp grit, derived from the limestone used in its manufacture. An instructive instance derived from the experience of an American firm may be very usefully quoted in this connection. The firm in question had, of course, a sand-catcher for their sulphite pulp, but they put down additional plant and greatly increased their production of the pulp, while at the same time forgetting to install a larger sand-catcher. The result was that until they found out what was the matter their paper suffered greatly, to say nothing of the wires of the paper machine and all the rollers.

In the calender machine especially the rollers were scratched and dulled so much as to want re-turning.

Sticky, insoluble stuff from rosin size is almost worse than sand and grit. It messes everything up and entails great cost for cleaning and stoppages. Emulsification of the size is a valuable preventive, but even the rosin milk is apt to contain hard particles, which, although they are necessarily small, can do nearly as much mischief as the coarser particles in an unemulsified size. The precaution to be taken is to arrange the outlet pipe leading to the hollander, as above described in the case of the dye dissolving vat. Sulphite pulp, too, is particularly apt to contain unacted upon rosin when it has been made from immature wood, so that we have in it a danger quite separate from that incurred by the use of rosin size. Sulphite pulp makers are too prone to guarantee their products as pure. With young trees no amount of sulphur dioxide that can be used will always ensure a pulp perfectly satisfactory from the paper-maker's point of view.

Many mineral pigments, such as ultramarine, Prussian blue, lampblack, ochres, etc., are incorporated with paper-pulp, and are prepared before going into the hollander in special vats, just as the soluble dyes, sizes, etc., are. Here there is an obvious risk of lumps getting into the hollander, but there is one special point about the treatment of this class of substance, viz., that it is not a question of solution. The pigment must go to the hollander in the solid state. There is, hence, all the more reason for care. In the first place the pigment must be ground as finely as possible in the dry state before it is used. The artist remembers how vital it is for his results that his pigments should be finely ground. The paper-maker, although it is as important for him as for the artist, often forgets it. The pigments must be ground until their particles are as fine as they can be. As regards the other precautions, they are again the same as above detailed as regards the position of the outlet pipe and the provision of a strainer mechanism. A stirrer is, however, not necessary; once the pigment has been properly ground and is stirred up by hand in the vat it will settle very slowly. Nevertheless, a mechanical stirrer is useful, but must be worked slowly if it is to replace an occasional stirring up by hand.

Strainers for outlet pipes are best made of fine copper gauze, and must be so fitted that while they fit accurately into the outlet pipe they are readily accessible from the inside of the vat, so that they can be removed and cleaned whenever they show signs that they are beginning to be choked. Iron-wire gauze is altogether unsuitable. It always rusts sooner or latter, and then rust particles are detached from it by the current of liquid and carried into the hollander, whereupon the stuff gives a paper full of iron stains. In fact, an iron-wire strainer gives rise to exactly those effects which a strainer is supposed to prevent.

In conclusion, there is one more point to be mentioned. It will have been gathered from the foregoing remarks that an outlet pipe entering the supply vat at a proper distance above the bottom of the vat and provided with an efficient strainer is the most effective of all the preventives of access of undesirable particles to the hollander. Nevertheless this admirable arrangement may lose half its value unless the supply vats are large enough to permit of their contents being left to stand for a time before being drawn off, so that a large part at least of the solid particles may sink below the draught of the outlet pipe. If the pipe is in action while the stirrer is still going the strainer is unfairly handicapped and will get choked very quickly.

—The Edward Partington Pulp and Paper Co., St. John, N.B., have bought the tug "Serena E.", and will use her in connection with their mill.

REVISED AUSTRALIAN TARIFF

The following schedule shows the rate of customs duties enacted on goods affecting the pulp and paper trades as recently revised by the Australian Government. The first column shows the general tariff and the second column the preferential tariff on goods the produce or manufacture of the United Kingdom:—

356. Paper, viz.:—

	General	Preferential
(a) Manufactures of, framed (including the weight of the frame), or unframed, having advertisements thereon, including Price Lists n.e.i., Trade Catalogues n.e.i., Show Cards n.e.i., and all Printed Photographed or Lithographed Matter, Pictures n.e.i., and Posters of all kinds, used or intended to be used for advertising purposes; also all Printed Bags and Cartons; Calendars and Almanacs n.e.i., per lb.	6d.	
or ad val. whichever rate returns the higher duty	35 per cent.	
(b) Printed matter and photographs the property of any public institution and intended for deposit or exhibition therein	Free	
(c) Australian Directories, Guides, and Time Tables, per lb.	6d.	
(d) Printed Matter n.e.i. (except newspapers registered for transmission through the post) being or containing advertisements, including Magazines containing advertisements being more than one-fifth of the printed matter contained within the outside covers, per lb.	6d. up to and including 9th December, 1907 (Not now operative. Free under item 371.)	
(e) Printing, in Rolls or Folios, known as Newspaper, to be used exclusively for Newspapers under Departmental By-laws, in sizes not less than 20 x 25 inches or its equivalent	Free	
(f) Printing n.e.i.	Free	
(g) Writing (plain) cut less than 16 x 13 inches and not in stationery packets, ad val.	15 per cent	10 per cent
(h) Ruled and Bordered Papers, ad val.	25 per cent	20 per cent
(i) Browns, and Sugar (grey, blue and other tints); Fruit Bag Paper, Candle Blue and Grey Paper, Candle Carton Paper, per cwt.	5s.	4s. 6d.
(j) Cartridge and Blotting, per cwt.	5s.	4s. 6d.
(k) Strawboard, per cwt.	1s. 6d.	
(l) Bags n.e.i., per cwt.	8s.	7s. 6d.
(m) N.E.I., including Pulpboard*; Cloth-lined Boards; and Cloth-lined Paper; Floor Paper; Paperhangings, or Wall Papers; and Toilet Paper in rolls or packets, ad val.	20 per cent	15 per cent
(n) Millboard; Cardboard; Pasteboard; Greyboard; Leatherboard; Woodboard; and Manillaboard, ad val.	5 per cent	Free

* Note.—Pulpboard shall mean a pulp paper whether plain, colored, or coated, which at the size of single royal 20 x 25 inches or its equivalent, weighs 80 lbs. or over per ream of 480 sheets. Paper, which is below the weight which constitutes "boards," to be dealt with under the paper duties.

		General	Preferential
	(o) Flint or Surface Coated Paper, plain or embossed, also Marble and Foil Paper and Boxmakers' Borderings and Lace Paper	Free	
	(p) Coated Boards, n.e.i., which at the size of a single royal 20 x 25 inches or its equivalent, weighs 80 lb. or over per ream of 480 sheets, ad val.	25 per cent	20 per cent
	(q) Pulpboard in the Reel for coating, subject to Departmental By-laws	Free	
	(r) Gummed Paper, n.e.i., ad val.	20 per cent	
	(s) Vesta and Match-boxes empty, n.e.i., per gross	3d.	
	(t) Vesta and Match-boxes having advertisements thereon, empty, per gross	6d.	
	(u) Cards, Playing, in sheet or cut, per dozen packs	3s.	
	(v) Fashion Plates and Books	Free	
	(w) Paper Shavings and Waste Paper for Papermaking	Free	
	(x) Emery Paper; Emery Cloth; Flint Paper; Flint Cloth; Filter Paper; Litmus Paper, ad val.	5 per cent	Free
	(y) Pulp, for manufacturing paper	Free	
	(z) Roofing, Sheathing, and Insulating Paper	Free	
	(aa) True Vegetable Parchment	Free	
	(bb) Writing and Typewriting Paper (plain), in sheets not less than 16 x 13, ad val	5 per cent	Free
	(cc) Copying, Tissue, and Tissue Cap Paper and Paper for Paper Patterns, in sheets or rolls, weight not to exceed 9 lb. for 500 sheets 20 x 30 inches	Free	
	(dd) Monotype Paper for use in the Monotype Machine	Free	
	(ee) Paper specially prepared for coating with photographic emulsions	Free	
	(ff) Waxed Stencil Paper, and Carbon Paper in Packets or otherwise	Free	
357	(a) Stationery, manufactured; including Bill Files and Letter Clips; Cardboard Boxes, cut and shaped, or finished; Mounts for Pictures; Date Cases and Cards; Albums, including Birthday, Scrap, Motto, and Character; Cards, and Booklets, including Printers', Visiting, Menu, Programme, Wedding, Funeral, Christmas, Easter, New Year, and Birthday; Scraps; Transfers; Ink Bottles; Ink-wells; Paper Knives; Blotters; Blotting Cases and Pads; Billheads and other printed, ruled, or engraved forms of paper n.e.i., bound or unbound; Books—Account, Betting, Cheque, Copy, Copying, Diary, Drawing, Exercise, Guard, Letter, Music, Memo., Pocket, Receipt, Sketch, and the like; Envelopes; Stationery Packets; Wrappers for Writing Paper; Memo. and Sketch Blocks: Memo. Slates and Tablets; Labels, Tags, and Tickets; Sealing and Bottling Wax; Post-cards n.e.i.; Book-markers; Writing Desks (not being furniture); Writing Cases; Stationery Cases; Paper Binders; Card Hangers; Pen Racks; Book-binders' Staples; Charts for manuscript use; Corrugated Strawboard; Strawboard made into bottle envelopes; Confetti Paper; Printed Parchment, ad val.	30 per cent	25 per cent
	(b) Manufactures of Paper n.e.i., ad val.	30 per cent	25 per cent
	(c) Matrices for stereotyping purposes, having a superficial area of 12 square inches or under, each	1s.	
	For every square inch of superficial area over 12 square inches	1d.	
358	Printing and Stencilling Inks, n.e.i., per lb.	6½	6d.
	or ad val.	30 per cent	25 per cent
	whichever rate returns the higher duty		
359	News Printing Ink, invoiced at 6d. and under per lb. and in packages containing not less than 1 cwt., ad val	30 per cent	25 per cent

		General	Preferential
360	Writing Ink and Ink Powders, ad val.	30 per cent	25 per cent
361	Ceramic Transfers for Pottery, ad val.	5 per cent	Free
362	Kindergarten Materials prescribed by Departmental By-laws	Free	
363	Paper Patterns, not being connected or associated with advertising matter, ad val.	5 per cent	Free
364	(a) Pens, n.e.i., without holders or not including holders, ad val.	5 per cent	Free
	(b) Ink Stands, Fountain Pens, Pencils n.e.i., and Rulers, ad val.	5 per cent	Free
	(c) Academy Boards, ad val.	5 per cent	Free
	(d) Pencils of Wood, but not including pencils with metal or other clamps or attachments, also penhandles of wood (including metal attachments for nibs	Free	
	(e) Fancy Pencils, ad val.	30 per cent	25 per cent
	(f) Pencils of Wood with metal rubber or other attachments	Free	
	(g) Pencil cases wholly or partly made of gold, silver, aluminium, or nickel; Pen and Pencil Sets and Penholders, n.e.i., ad val.	30 per cent	25 per cent
	(h) School Pen and Pencil Sets and Boxes	Free	
	(i) School Pencil Sets and Boxes	Free	
	(j) Penholders other than of wood, not being partly or wholly made of gold or silver	Free	
365	Maps, except those of Australia or any part thereof; and Charts, n.e.i., ad val.	5 per cent	Free
366	Globes; geographical, topographical, and astronomical, ad val.	5 per cent	Free
367	Parchment, cut and uncut, ad val.	5 per cent	Free
368	School and Drawing Slates; Slate Pencils, ad val.	5 per cent	Free
369	Stay Paper and Stay Cloth, gummed on one side, in rolls cut to a width of not more than two inches, ad val.	5 per cent	Free
370	(a) Leatherette, ad val.	5 per cent	Free
	(b) Licht-pausrohpapier	Free	
371	Books n.e.i.; Prospectuses and Catalogues (other than trade), n.e.i., and all printed matter, n.e.i.	Free	

ONTARIO'S FORESTRY POLICY.

An interesting feature of the Guelph Live Stock Show this month was an address by Prof. E. J. Zavitz, in which he explained the forestry policy of the Ontario Government. He stated that during the past year 400,000 plants had been distributed, the varieties being Scotch, white and jack pine and black locust. An interesting feature of the work was the manner in which it had been taken up by the public school children. In Ontario there were hundreds of square miles of land, to attempt to farm which was simply a waste of human life, and which could only be developed for reforestation. Of such land 10,000 acres had been located in Norfolk, 40,000 in Lambton, 40,000 in Simcoe, 6,000 in Durham, and 8,000 in Northumberland. In addition, there was the whole district north of Parry Sound, which presented an appalling problem. In acquiring an area of 3,000 acres in Norfolk the Government had commenced to tackle the problem. The lands he referred to were naturally adapted to reforestation, and, covered as they were with scrub pine and oak, would renew themselves but for the forest fires that swept through them.

—Lord Northcliffe, who has been on an extended tour through Canada and the United States, has now gone to Newfoundland to inspect the work which has been done on his company's paper mills.

CHROMO PAPERS.

Owing to the demand for excessively cheap paper and to the fact that the quality of the paper is concealed by the coating, the body paper is frequently composed very largely of mechanical wood. Such a paper may be cheap, but in a fast-running press, whether lithographic, photoplate or letterpress, it will give such a large proportion of "broke" and necessitate such frequent stoppages of the machine for removal of the torn pieces, that its use becomes expensive in the end. Mechanical wood, on account of the short, non-felting fibres, gives papers with extremely poor resistance to creasing, and, although the gelatine of the coating may somewhat improve the tensile and tearing resistance of the paper, it does not improve its resistance to creasing. Every fold and crease which occurs in the machine becomes a break, and the pieces which are not carried through by the travelling arrangement will have to be picked out by hand. Another striking point in chromo papers is imperviousness i.e., the water-resisting of the gelatine coating. If the gelatine be insufficiently tanned the papers are not suitable for lithography, since the coating is attacked by the moisture of the stone. Further, the colors strike in too deeply, so that the picture is dull and flat-looking. Bronze colors are almost impossible on such papers. These papers may be considerably improved by a ground impression of a varnish which imparts the necessary water-resistance. But even then a paper which is too sensitive to water does not work well for multi-color lithography, since it gives a bad register. While insufficient tanning of the gelatine is a grave fault, excessive tanning may be just as objectionable. In the first place it makes the coating hard and brittle, and causes many spoiled sheets. In the next place over-tanned papers contain an excess of the tanning salts (alum or chromium salts); these salts diffuse out of the paper and are absorbed by the moisture of the stone, and possess the property of attracting the fatty substances of the ink. In the course of time the stone then takes up ink from the rollers in places where it is not intended to do so, and the machine has to be stopped for these places to be wiped clean or for the retouching of the design. A good chromo paper, therefore, requires considerable care in its manufacture to avoid excessive softness or hardness of the gelatine coating, and its price of necessity must not be too low. The body paper must not only possess the necessary strength, but it must also be carefully prepared in order that the register may be preserved. The paper must be "non-stretching," that is, a paper which has been already stretched by calendering under such strong tension and heavy pressure that no further expansion is possible on wetting. In order that the strength of the paper shall not suffer under such treatment, a really good quality of fibre must be used. For photo printing the requirements of the paper are of the same nature, but more rigorous. When the coating of the paper is not sufficiently hard, the impression dries too quickly, and when, on the other hand, there is excess of of tanning salts, the lights of the collotype plate refuse to take up moisture and the plate is spoiled. Here, also, a varnish ground may improve matters, but it is cheaper in the end to pay more for a really suitable paper—Centralblatt.

SCANDINAVIAN PULP MARKET.

The market in November has been quiet, and developments have not reached so far that it is possible to tender an opinion whether or not there is a change approaching in the near future. On the British market for wood pulp Scandinavian manufacturers have hardly done any business at all, and on the Continent the business done is hardly worth men-

tioning. Germany, Belgium, Holland and France seem to be quite devoid of demand, at least for prompt, while the Germans at any rate are preparing for the future.

Markets outside of Europe have been considerably better which for a great deal seems owing to the fact that business in the United States is gradually becoming normal, and the consumers there do not hesitate in preparing their future contracts on a basis of improved trade.

Considered generally, the market for cellulose seems to be on the same level as it was a month ago, but as everybody concerned well knows it leaves much to be desired. If there really could be an improvement within reasonable time, it would be a boon to both sellers and buyers.

At present, however, sulphite wood pulp is having a hard time of it, and mills that have not been lucky enough to grasp the scattered occasions to do business that now and then have turned up have been obliged to accept a couple of shillings less per ton than many of their contemporaries previously have obtained. The business transacted is, however, insufficient to say that there has been any further decline. Good brands have fetched their previous prices among old and well known customers. One or two quite large contracts for long forward deliveries have been closed recently, and the buyers in question seem to be fully aware that the present moment is favorable for purchasing. Bleached sulphite has not been in demand.

All over the line the wood pulp-makers are endeavoring to bring down the cost of production in order to keep the balance on the right side, and the newest mills are striving to make their qualities first class. Advantageous contracts for coals and other materials are being made, while prices for timber the head item, are as high as ever. The Scandinavian Wood Pulp Association is considering a limit in the production and at many mills the production has already been reduced about 30 per cent. This will help greatly to regulate production with what the consumption will be for some time forward.

THE HISTORY OF WOOD PULP.

A few words towards a history of the wood pulp industry will not be without interest. The history is still unwritten, but it is certain that in competent hands it can be made a most valuable addition to the story of industrial progress.

The invention of wood pulp is due, curiously enough, to a weaver—viz., Gottlob Keller, born in 1816 in Saxony. A great observer of nature, he had noticed that wasps made nests of a substance closely resembling paper, the raw material of which consisted of wood-raspings torn off from trees by their horny jaws, and he actually constructed a model machine with which he produced teaspoonfuls of wood pulp. Somewhere about 1850 he made the acquaintance of a moneyed man named Voelter, and in conjunction with him started pulping wood on an industrial scale in Germany and Switzerland in the year 1852. In 1858 Keller and Voelter's plant was adopted by Berges at Lorp, and shortly afterwards at the Souche Paper Mills. The plant there was constructed by the Parisian firm of engineers, Warrall, Elwell & Poulot. At the Paris Exhibition of 1867 Voelter, with the assistance of Voith, showed a complete wood pulping installation, including every machine from the first sawing-up of the trunks to the centrifuging of the pulp. This exhibit caused almost a sensation, and Achille Berges gave a course of lectures upon it. Shortly afterwards, Aristide Berges and Fredet called attention to the frequency of mountain cataracts in forest country, and to the cheap source of power which they offered. At the present day France possesses thirty

wood pulp factories, turning out 66,000 tons of pulp a year towards the annual consumption of 220,000 tons. In 1866 Fredet and Matussiere were in negotiation with Voelter for the purchase of his French patent, when they suddenly discovered that the patent was void, as one of the annual payments due in respect of it had not been made. The invention thus became public property, and has been so since 1867.—Paper and Pulp.

LUBRICATION FOR PAPER MANUFACTURERS.

J. A. De Cew, chemical engineer, Montreal, sends us a copy of one of his reports upon paper mill lubrication, which our readers may find of interest. In testing mineral oils, he tells us, the Saybolt viscosimetre is used, which is the standard apparatus for this work, though it is rather difficult to procure. Mr. De Cew not only makes all the necessary tests upon oils and other lubricants, but is in a position to recommend the most suitable lubricants for special requirements in paper mills.

The specimen report is as follows:—

Having given this matter considerable consideration in connection with your requirements and the specifications you desire, I beg to submit the following suggestions, in regard to your methods of lubrication:

Taking as a basis of comparison the quality of oils that you are using, and the prices that you pay for these, it will be very difficult to find in your case any cheaper lubricants, providing that your bearings are equipped with appliances for conserving and recovering the oil.

Greases are generally introduced into a plant, when the loss of oil is greater than the extra cost of the grease supplied. There are therefore special conditions under which greases are useful, such as hot bearings which are not supplied with an oil bath.

The general principle which divides lubricants into two classes is as follows: All pure mineral products are lacking in certain properties of greasiness, which are possessed by animal and vegetable lubricants.

On the other hand vegetable oils and certain animal products, when used alone have a tendency to decompose with the formation of fatty acids.

In America economical practice demands the use of mineral oils, but when the best lubrication is desired, the lubricating properties of these can be improved by the addition of small quantities of animal oils.

If therefore pure mineral lubricants are used, it is desirable to have as an emergency lubricant, an oil or grease of animal origin which is mixable with the mineral oil and can be used when necessity requires.

The average lubricating grease is a saponified product and cannot be used to advantage to increase the efficiency of an oil.

Certain greases are made from lime, fatty acids and mineral oil, and are used as cup greases. Others are made using soda or potash as the saponifying agent and carry considerable water, and have high melting points. These are called sponge greases, and are used mainly on bearings that are always hot like those of a paper machine.

A different lubricant of recognized value is graphite, which when properly mixed with oil or grease is of great value.

As a means of obtaining the best lubrication from the best materials I would suggest that in addition to your mineral stocks, you have in reserve a grease consisting of either pure tallow, or wool wax, bought on a specification limiting the acidity, such as (total acidity not to exceed 1 per cent., calculated as oleic acid).

This can be used on hot bearings either direct, or in admixture with the oil.

In addition to this you might have a stock of graphite, finely ground and purchased on sample, and subjected to sieve and flotation test.

This can be used on hot bearings direct, or mixed with the grease or oil.

These three classes of lubricant should cover your entire requirement unless you wish to use a grease instead of an oil on your paper machines.

In this case a sponge grease consisting of 75 per cent. saponified tallow and 25 per cent. of 22 degree paraffin oil, should give excellent results.

Soft cup greases are generally made from waste products, and are not such good lubricants as a well compounded oil.

The compounding of the oils to suit special requirements can be done very well at the works by the man in charge of lubrication

EFFECTS OF PRINTING ON SIZING OF PAPER.

It happens sometimes that the sizing of a paper is completely destroyed by passing through the printing press. In one case a paper intended for envelopes, after having been printed on one side with a design to prevent its being read through, acted like blotting paper when an attempt was made to address the envelope. Another case is that of a ledger where the paper had lost its size along the lines with which it was ruled into columns. The case discussed by the professor is that of a paper for labels, printed on one side and gummed on the other. It was thin, red, and made chiefly from mechanical wood pulp. The printing was clear, and hardly visible from the back of the paper until the gum was applied, when the printing ink immediately passed right through the paper and formed stains on the gummed side. The sheets were of quarto size. Near the edges the size resisited the penetration of the gum. The penetration was least apparent round the smaller letters. It appears that the phenomenon is due to the volatile ingredients of the printing ink sinking into the paper and softening the rosin of the size. Various remedies are suggested. The most obvious one is to gum the paper first, instead of deferring the gumming until after the paper has been printed. Others are to use a thicker and hence less penetrating gum mucilage, or to size the paper more heavily. Dr. Klemm, who has observed several similar cases, considers that the cause of the effect on the size is still doubtful. He has observed it even in papers very carefully and thoroughly sized, and has also noticed that papers less sized than those in which the phenomenon manifested itself were unaffected by printing in the same press, and under conditions exactly the same in every other respect. Dr. Klemm thinks, however, that the ink has really something to do with it, as a given paper may have its size affected by one ink and not by another; perhaps by what is considered a good ink, and not by what is regarded as an inferior ink.—Wochenblatt fur Papierfabrikation.

TOBACCO AS A COMPONENT OF CIGARETTE PAPER.

With the view of preventing the odor of any foreign substance from interfering with the aroma of cigarettes, a correspondent of the Papier-Fabrikant advocates the use of tobacco leaves in the manufacture of cigarette paper. They are said to possess a surplus of fibrous substance, adapted to the production of paper, and not to require any felting, but only a kind of sizing. It is suggested that the stalks of the tobacco plant would likewise be available in the making of cigarette paper. These are however, very hard, requiring a long maceration and the subjection of the fibres to a mechanical process, so as to reduce them to a powdered condition.

TESTING GREASE-PROOF PAPERS.

It is usually considered that if a paper when held for a short time over a flame becomes blistered, it may be passed as grease-proof, because the formation of the blisters is a proof that steam developed in the interior of the paper by the heat cannot escape through the outer layers. This test may, however, be falsified by the existence of minute holes, invisible to the naked eye, but affording a free passage to liquid fat, and occurring at places where no blistering occurs. Hence a better test is wanted. This is at hand in the turpentine oil test. This test not only shows whether the paper is grease-proof or not, but reveals the presence of any holes which may be the cause of the failure of the paper. The test is carried out in the following manner: A few drops of pure oil of turpentine are rubbed heavily over the paper with the finger, there being at the time a sheet of blotting paper under the paper being tested. If the blotting paper shows by a stain that the oil of turpentine has passed through the sample under examination, grease will be able to do the same. The presence of holes in the paper will be shown by darker marks on the blotting paper, as the turpentine passes to it in larger quantity through the holes than through the substance of the defective paper.

WOOD PULP INDUSTRY IN NEW ZEALAND.

A Christchurch syndicate is the first body to take advantage of the provision under the Land Laws Amendment Act, which sets apart land for the development of the wood pulp industry in New Zealand, says the Canadian Trade Commissioner in those islands. It has secured a lease of 30,000 acres in the Westland District, about ten miles from Lake Brunner. Paper-making from wood pulp forms an important industry in the United States and Canada, from which New Zealand largely imports, and it is probable that the new venture will prove to be the beginning of an industry which will assume great proportions in New Zealand, with its immense areas of suitable bush lands. The timber used for wood pulp is not the ordinary millable timber, but the smaller trees and scrub. The land referred to is covered with bush, which grows very freely, so that any gaps made are soon effaced by the natural growth. In 1906 New Zealand imported printing paper to the value of £133,009, representing 156,724 cwt., in addition to miscellaneous paper of various descriptions.

RUBBER CYLINDERS IN PAPER-MAKING.

Two German paper-makers speak of the use of rubber-covered cylinders as lower couch-rolls. One of them affirms that the rubber-covered cylinders last much longer than others and that the action on the web is superior to that of felt-clad cylinders. Besides, even at a higher speed of working the squeezing is more efficient, so that the output of the machine is increased. The other was obliged, three years ago, in consequence of the breakage of the axle of a lower couch-roll, to put in a new cylinder coated with rubber, the idea being that the elasticity of the coating would prevent a recurrence of the accident. The new cylinder has been at work ever since, and is still in perfect condition. The old cylinder was faced with copper so that the character of the paper varied from day to day, and ample opportunity was afforded for comparing the old with the new product. The difference was considerable, and wholly to the credit of the rubber-covered cylinder. The paper came from it with more body, and more suppleness than had previously been the case—qualities especially valuable for printings; the impression of the wires, too, was less pronounced; and the paper retained more of the kaolin used as a loading material. The texture of the

paper was even better than that made with the use of the copper cylinder.

It is easy to see that a rubber-covered cylinder adapts itself much better than one covered with copper to irregularities in the upper couch-roll. It has been already mentioned that the rubber casing is highly satisfactory from the point of view of durability; but even when the surface of the rubber is worn it is easily put right. Rubber cylinders are specially useful for machines working pulp containing large quantities of waste paper, as lumps and knots do not then make holes in the web as they do with copper rolls.

BRITISH PAPER TRADE.

For the ten months ended October the imports of paper and stationery into Great Britain stand at £4,894,488, an increase of £228,529 compared with the same period of last year. The receipts comprised the following: Printings or writings on reels, £782,140; printings or writings not on reels, £1,281,893; hangings, £134,116; other printed or coated papers, £338,321; packings and wrappings, £1,403,012; strawboard, £534,82; and mill and wood pulp board, £420,124. Imports of printings and writings on reels (compared with the corresponding period of last year) show a decline of £69,127; printings and writings not on reels, a decrease of £1,084,561; hangings, an increase of £6,647; other printed or coated paper, a reduction of £38,924; strawboard, an advance of £18,070; and mill and wood pulp board, a falling off of £5,988. The reason of the heavy decline in printings and writings not on reels is that packings and wrappings (previously included) are for 1908 shown separately; if the values in each instance be added together, the total (£2,684,905) shows an increase of £318,451 instead of a decrease of £1,084,561. The fact cannot be ignored, remarks the "World's Paper Trade Review," that enormous supplies of foreign packings and wrappings find an outlet in the United Kingdom. So far as reel paper (printings and writings) is concerned, the competition of the United States has dwindled greatly, the depreciation in value so far this year amounting to £76,093. Sweden, which holds the premier position in exporting reel paper to the United Kingdom, shows a small increase of £847, but Norway has improved her shipments to the extent of £32,153. The continental countries—Germany, Netherlands and Belgium—show a comparative loss of £30,871.

Although the export trade falls rather short of that of last year, the difference is not so marked as in many other industries. The shipments of British paper for the ten months ended October, £1,926,424, shows a decrease of £33,857 compared with corresponding period of last year. The principal demand is for printings, the exports for January-October being of the value of £874,496, the purchases of foreign countries amounting to £320,045 and British Possessions £554,451. The principal market for printings is Australia, the trade representing 23.7 per cent. of the total value, followed by British India with 15.4 per cent.; France, 10.4 per cent.; New Zealand, 7.8 per cent.; B. South Africa, 6.4 per cent.; Canada, 5.9 per cent.; and the United States, 1.2 per cent. Writings were exported during the ten months to the value of £377,259, foreign countries taking £112,793 worth and British Possessions £264,466 worth. Australia is also the chief market for British writings, the supplies representing 22.4 per cent. of the total value; shipments to B. India amount to 15.4 per cent.; New Zealand, 9.7 per cent.; B. South Africa, 9.4 per cent.; France, 5.1 per cent.; Canada, 3.4 per cent.; and the United States, 2.1 per cent. The countries receiving other exported articles are not specified in the returns, with the exception of "unenumerated," despatched to the value of £135,821, foreign countries—the principal buyers—being responsible for £77,419, and British Possessions £58,402.

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FAULTS OF CYLINDER MADE BOARDS.

In good class boards made on the cylinder machine a fault is frequently observed which shows itself in the form of long, broad creases which are produced, generally near the edges, on the sheet of paper as it is transferred from the wet couch felt to the press roll on which the board is being made up. These creases are most frequent when the couch roll which picks the paper off the wire cylinder is very thickly jacketed, and particularly after the machine has been started again after a long standstill. The cause of the creases is the drying up of the wet couch felt and of the felt jacket of the couch roll. By drying the felt becomes full of air, which becomes imprisoned when the felt is wetted to start again. When the pressure comes on the felt in the operation of couching the imprisoned air attempts to escape, but its free egress is prevented by the sheet of paper on the top of the felt. In this way a blister of air is formed between the paper and the felt, and when this reaches the making up press roll the blister is pressed forward in the form of a long crease about 1½ inches wide. The edges of the crease appear raised and the middle depressed. These creases occur most often near the edges of the sheet because the felt jacket dries most rapidly at the edges. In order to prevent the fault the couch roll should be kept under the water during a standstill or else it should be run without making paper for several minutes before starting up, and while so running the felt and roll so running should be sprayed with water until the air is displaced.

ROSIN SIZING WITH HARD WATER.

Rosin sizing in the hollander has gained ground steadily during the last ten years. Thanks to the production of soaps containing large percentages of free rosin, and hence giving highly emulsified solutions, it has become possible to rosin-size papers more thoroughly than could be done before, and yet with less rosin. These fortunate results have not been obtained to the same extent by all paper-makers. Soaps rich in rosin require light solutions to give very finely divided emulsions—those, that is, that give the best sizing. Paper mills which have at their disposal hard water only meet with many difficulties in dissolving their rosin soaps. These difficulties are both technical and economic, and sometimes attain such proportions as to lead to the abandonment of rosin sizing altogether. Experience has shown that the nature of the water used plays a most important part in paper sizing. Although precise data as regards the effects of hard water at successive stages of the sizing process have not yet been formulated, the general fact remains that the richer the soap is in rosin the worse the influence of the hard water is.

The deleterious action of the hard water takes the shape of decomposing the rosin soap, forming insoluble and useless resinates of lime and magnesia. The formation of these insoluble rosin soaps not only wastes rosin, but their presence in the sized paper is inimical to its durability, as they are decomposed by inks. T. Klemm, of Leipzig, explains the phenomena attending the action of hard water on rosin size in the following terms: "When the usual process is employed, i.e., when the size is mixed with the pulp in the beating engine, or, what is the same thing, with the water wherewith the engine is supplied, the sulphuric or carbonic acid and the salt of the alkaline earth is dissociated in solution from its base, and combines with the soda and the size, thereby setting free an equivalent amount of resinic acid, which in its turn combines entirely or in part with the base dissociated from the mineral acid, thus forming resinate of lime or magnesia as the case may be."

Paper mills which use hard water will find it of the utmost importance to use as little water as possible. The lighter the pulp the finer—i.e., the richer in free resinic acid—the solutions of rosin soap will be, and the more of the resinates of lime and magnesia will be formed in the pulp to the detriment of the durability of the paper, and with the accompanying undue waste of rosin.—Moniteur de la Papeterie Francaise.

UTILIZATION OF PAPER SCRAPS.

Repeated calculations and experiments have shown that when no economizer is attached to a paper machine it wastes about 8 per cent. of the pulp, i.e., makes ninety-two tons of paper when it might make too. The remedy is, of course, to filter the waste water withdrawn from the wires by the suction boxes, and the Fullner filter is well spoken of in Germany. If the pulp comes on to the wires in the proper state, i.e., free from excess of water, a filter may be made to act as fast as the paper machine delivers to it. Hence the residue of fibre in the filter is ready to go straight back to the feed-box. Another use of the Fullner, or of any other efficient pulp filter, is to purify washings obtained from the pulp before it reaches the machine. In this way considerable residues are obtained which can be used to increase the bulk of pulps in course of manufacture into cheap heavy papers, such as wrappings, both for bales and for small parcels of goods sold retail.—Papier Zeitung.

MAKING BROWN MECHANICAL BOARDS.

The Papier Zeitung contains an article on the manufacture of Swedish wall-

boards from brown mechanical pulp on the Fourdrinier machine.

For making this kind of pulp the logs of wood are steamed for forty hours under 15 lbs. pressure in long horizontal cylindrical vessels, built of cast-iron sections bolted together. The steam logs are transported by a chain elevator to the grindstones. These are very coarse grained, and are scored with four to six grooves per inch, which are recut twice every twenty-four hours or oftener. A long slender fibre and high production are only obtained if the logs are ground when they are quite fresh from the steamers. The pulp is strained through slits 1½ millimetres wide; the refiners must be charged with pulp as concentrated as possible. The warm-grinding process, both in the grinding machines and the refiners gives the most suitable quality of fibre. The stuff improves by standing in drainage chests for a few days before use. All the beating that is necessary is done in Kingsland's disc refining engines; these discs are cast in one piece, and the cutting grooves are planed out. From these engines the stuff is let down into hollanders, provided merely with circulating paddles, in which it is sized and colored; thence it passes to the stuff chests. The machine is worked without a strainer, and no top-wire or dandy roll is used. The great advantage of the Kingsland refiner is that it gives a very free-running, but still a very good felting fibre. Boards of a weight of 600 grammes per square metre are run at a speed of about twenty feet per minute. If the stuff does not drain quickly enough a very fine spray of steam is blown against the web before it comes over the suction boxes. Three or four wet presses are used and about a dozen drying cylinders. Smoothing rolls and a five or seven-bowl machine calender are used to give a good surface. A properly made board must be flexible, and the drying must not be overdone. Stone rolls are good for the wet presses because they are unaffected by the acid extractive matters of the steamed wood.

Boards made in this manner are also used for roofing boards, after impregnation with some waterproofing substance, such as a mixture of wood-tar and coal-tar and heavy tar oils. The tarry mixture is heated in a jacketed pan and fed into a trough in front of the calender. The web of board is led through this trough, and the excess of tar is squeezed out by a pair of press rolls, which are driven together by cogwheels to prevent slipping. The impregnated board is led over air-drying spar-drums and rolled up. With the tar dressing there is no danger of sticking, but with asphalt dressing further provision must be made for drying before reeling. This is done either on spar-drums or on drying cylinders which are protected from direct contact with the sticky board by means of small guide rolls.

For flooring boards a less odorous composition is used for impregnating, such as stearin and soap, or merely glue size; they can be made non-inflammable by means of water-glass.

Pulp boards are beginning to take a very important place in the building industry in Sweden, and improvements in their manufacture are constantly being developed. B.

THE MARKETS.

Toronto, Dec. 12, 1908.

The scarcity of ground wood continues, and, as a result of the small precipitation is likely to continue. Some moisture fell the latter part of last month, but in Quebec it was in the form of snow, which is not likely to add to the depth of water this season. Indeed, the fact that to all appearances winter has set in, both in that Province and in Ontario, thus congealing what little water there was, makes the situation a serious one for pulp and paper manufacturers to face. Mechanical pulp is held at from $22 to $25 at the mill, and there is not enough to go around. Sul-

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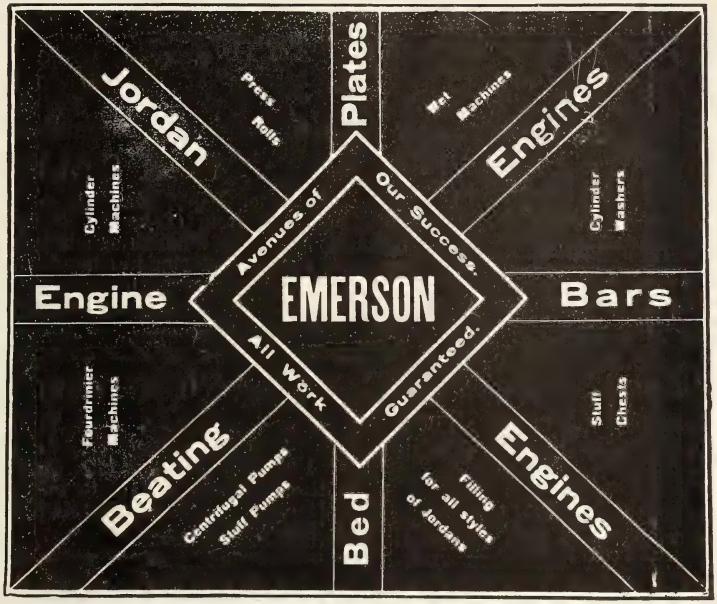

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phite realizes $2.10 to $2.25. Paper is very firm as a consequence of conditions in the pulp market. The demand for news print, and in fact for all kinds of paper is good, and increasing with the general improvement of business.

British.—The market for ground wood shows a firmer tone, says the "World's Paper Trade Review." Norwegian reports say that 50s., c.i.f. England is being offered for deliveries next year for unwrapped pulp. The rivers in Norway are very low. The market for chemical pulp is dull, but shows no further signs of weakening. Soda pulp is weak, owing to large stocks in hand.

Chemicals.—There is more enquiry for chemicals, and prices are steady, except for soda crystals, which are a little easier.

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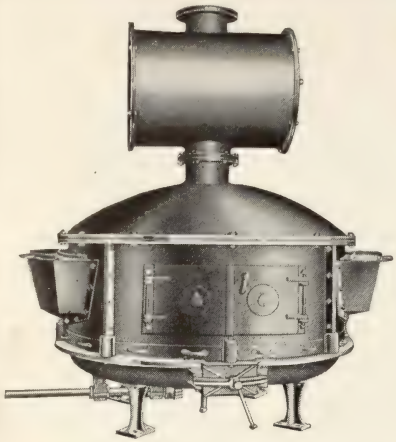

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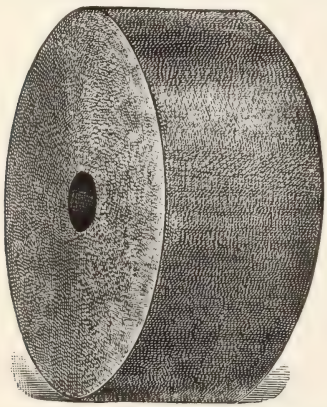

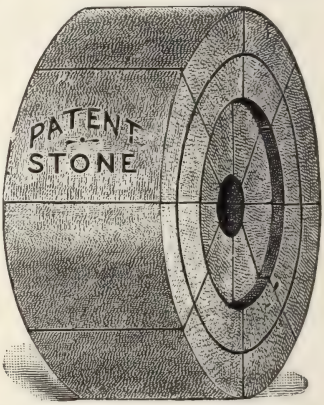

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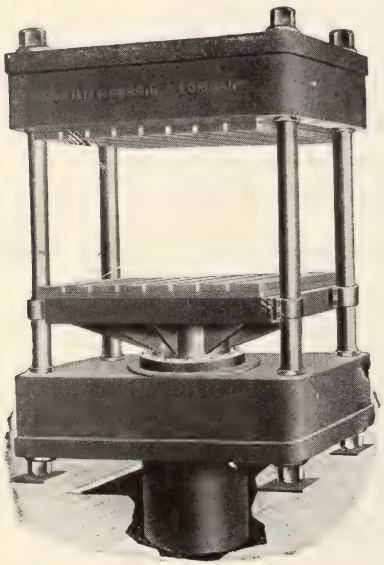

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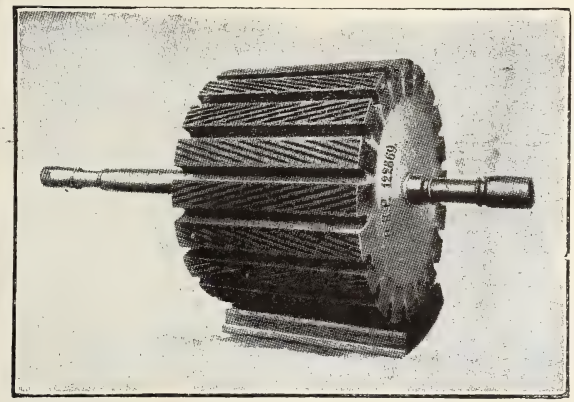

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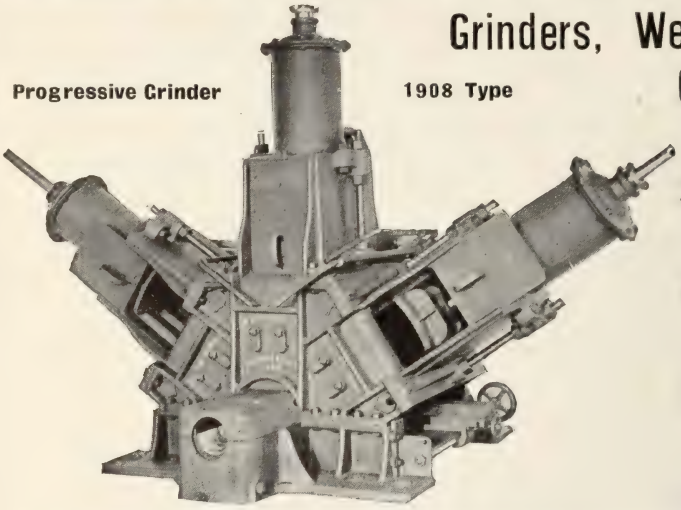

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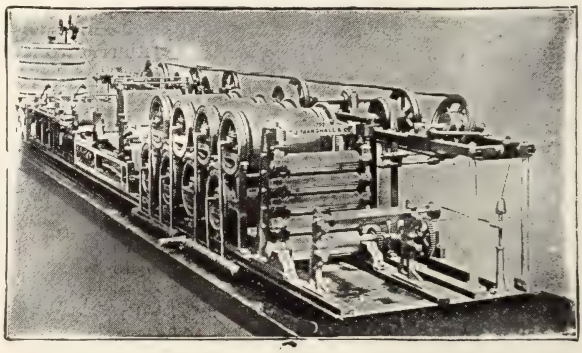

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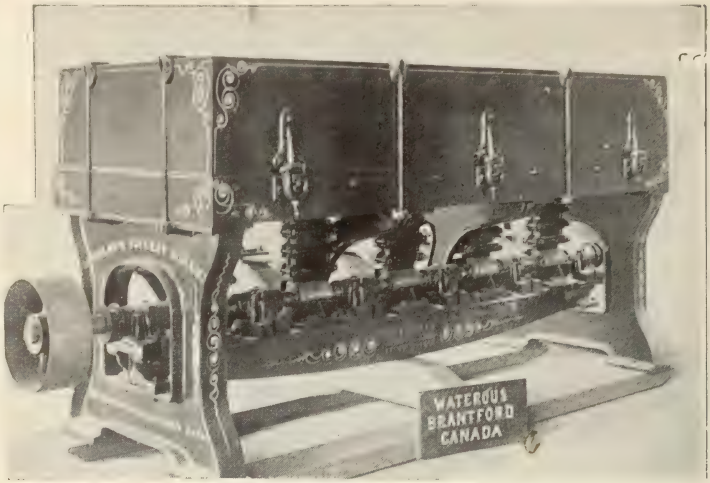

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